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SECRETARY OF THE AIR FORCE

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Flying Operations

C/KC-135 OPERATIONS PROCEDURES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This volume implements AFPD 11-2, *Aircraft Rules and Procedures.* It establishes policy for the operation of C/KC-135 (including 6 ARW, EC-135N and 15 ABW, C-135) aircraft to safely and successfully accomplish their worldwide mobility missions. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force. This instruction applies to Air National Guard (ANG) and Air Force Reserve (AFRC) units.

The Privacy Act of 1974 applies to certain information gathered pursuant to this instruction. The Privacy Act System Number F011 AF XO A, Air Force Operations Resource Management System (AFORMS) covers required information. The Paperwork Reduction Act of 1974 as amended in 1996 affects this instruction.

This document is new and must be completely reviewed. This instruction contains references to the following field (subordinate level) publications and forms which, until converted to departmental level (AF) publications and forms, may be obtained from the respective MAJCOM publication office:

Publications: AMCIs 11-207, 11-208, and 11-301.

Forms: AMC Forms 43, 54, 97, 148, 181, 196, and 305 (AMC).

SUPPORTING INSTRUCTIONS

KC-135 Configuration	AFI 11-2KC-135, Volume 3, Addenda A
Nuclear Employment SIOP (Classified)	AFI 11-2KC-135, Volume 3, Addenda B
KC-135 Special Operations	AFI 11-2KC-135, Volume 3, Addenda C

Chapter 1

GENERAL INFORMATION

1.1. General. .

1.1.1. This AFI provides procedures for C/KC-135 operations and applies to C/KC-135 aircrews and all management levels concerned with operation of the C/KC-135. It is a compilation of information from aircraft flight manuals, FLIP publications, and other Air Force directives, as well as an original source document for many areas. Basic source directives have precedence in the case of any conflicts, revisions, and matters of interpretation. For those areas where this AFI is the source document, waiver authority will be in accordance with paragraph **1.4.** For those areas where this AFI repeats information contained in other source documents, waiver authority will be in accordance with these source documents. All information applies to Pacer CRAG and MPRS operations, except where specifically excluded.

1.1.2. All units and agencies involved in or supporting C/KC-135 operations will use this AFI. Copies will be current and available to planning staffs from headquarters to aircrew level. Transportation and base operations passenger manifesting agencies will also maintain a copy of this AFI.

1.2. Applicability. This AFI is applicable to all individuals and units operating C/KC-135 aircraft.

1.3. Key Words Explained.

1.3.1. "Will" and "shall" indicate a mandatory requirement.

1.3.2. "Should" is normally used to indicate a preferred, but not mandatory, method of accomplishment.

1.3.3. "May" indicates an acceptable or suggested means of accomplishment.

1.3.4. "Note" indicates operating procedures, techniques, etc., which are considered essential to emphasize.

1.4. Deviations and Waivers. Do not deviate from the policies and guidance in this AFI under normal circumstances, except for safety, or when it is necessary to protect the crew or aircraft from a situation not covered by this AFI and immediate action is required. The Aircraft Commander has ultimate authority and responsibility for the course of action to be taken. Report all deviations or exceptions without waiver through channels to MAJCOM Stan/Eval function who, in turn should notify the OPR (lead command) for follow on action, if necessary.

1.4.1. Unless otherwise directed in this AFI, waiver authority for the contents of this document is the MAJCOM/DO. MAJCOM/DO staff should forward a copy of approved waivers to the OPR (lead command). Requests for a long-term (permanent) waiver must be approved by MAJCOM/DO and listed in MAJCOM supplement (see paragraph **1.5.**).

1.4.2. Short-notice waiver requests for missions (including missions under TACC operational control) use **Chapter 4**, waiver protocol.

1.5. Supplements. This AFI is a basic directive. Each MAJCOM or operational theater may supplement this AFI. These supplements will not be less restrictive than the basic document. MAJCOM/DOs

initiate long-term waiver requests to the basic document. Specify long-term waiver approval authority, date, and expiration date in the appropriate MAJCOM supplement. Limit supplements information to unique requirements only.

1.5.1. Combined Operations. Use only the basic AFI for planning or operations involving forces from lead and user commands. Commanders may use approved MAJCOM supplement procedures with assigned and/or chopped forces provided these forces receive appropriate training and the duration is specified. Commanders should not assume or expect aircrews from another command to perform MAJCOM specific procedures from their supplements unless these provisions are met. Questions by aircrews, planners, and staff should be forwarded to the OPR.

1.5.2. Coordination Process. Forward MAJCOM approved supplements (with attached AF Form 673, **Request To Issue Publication**) to HQ AMC/DOV, 402 Scott Dr., Unit 3A1, Scott AFB IL, 62225-5302. AMC/DOV will provide a recommendation to HQ AMC/DO and forward to HQ AFFSA/XOF for approval.

1.5.3. Prior to publication, units will send one copy of Chapter 10 to the parent MAJCOM OPR for validation through their appropriate NAF for coordination. Send final copies to HQ AMC/DOV, parent MAJCOM, and the appropriate NAF.

1.6. Requisition and Distribution Procedures. Unit commanders provide copies for all aircrew members and associated support personnel.

1.7. Improvement Recommendations. Send comments and suggested improvements to this instruction on AF Form 847**, Recommendation for Change of Publication**, through channels to HQ AMC/DOV, 402 Scott Drive Unit 3A1, Scott AFB IL, 62225-5302 according to AFI 11-215, *Flight Manual Procedures* and MAJCOM Supplement.

1.8. Definitions. The explanation or definition of terms and abbreviations commonly used in the aviation community can be found in FAR Part 1; *DoD FLIP General Planning*, Chapter 2; and Joint Pub 1-02, *The DoD Dictionary of Military and Associated Terms*. See **Attachment 1** for common terms.

1.9. Aircrew Operational Reports. The reporting requirements in this instruction are exempt from licensing in accordance with paragraph 2.11.10 of AFI 37-124, *The Information Collections and Reports Management Program; Controlling Internal, Public, and Interagency Air Force Information Collections*.

Chapter 2

COMMAND AND CONTROL

2.1. General. Command and Control of tanker and airlift forces is exercised through a network of Command and Control centers (C2). C2 centers are executive agents for commanders exercising operational control over mobility forces. The C2 network consists of the AMC's TACC, or respective MAJCOM C2 agency for MAJCOM (other than AMC) directed missions, theater Air Operations Centers (AOC), Air Mobility Elements (AME), unit C2 Centers, Air Mobility Control Centers (AMCC), Tanker Airlift Control Elements (TALCE), Special Tactics Team (STT), and the Pacific Air Force (PACAF) or United States Air Forces Europe (USAFE) Air Mobility Operation Control Center (AMOCC).

2.2. Execution Authority. Execution approval will be received through the local command post or command element. The operations group commander will be the executing authority for local training missions. The AC will execute missions operating outside communications channels.

2.2.1. Supplemental Training Mission (STM). Opportune airlift of cargo and mission personnel may be accomplished as a by-product of crew training missions. STMs may be authorized when minor adjustments can be made to a scheduled training mission or when a productive aircrew-training mission can be generated for the airlift. The training mission will not be degraded in any manner to accomplish the STM. Use of STMs for logistical support will be authorized only when normal military or commercial transportation modes are unable to provide required support. The operations group commander with wing commander coordination may approve STMs. On STMs, aircraft commanders will release maximum number of space available seats commensurate with mission requirements and safety.

2.2.2. Off Station Training Flights (OSTF). Wing Commanders are the approval authority for off station trainers. Prior to approval, commanders will carefully review each proposed trainer's itinerary to ensure it justifies and represents the best avenue for meeting training requirements. Commanders approving off station trainers will forward a copy of the planned itinerary to the appropriate NAF/DO, and MAJCOM/DOT or ANG/DOO. Approval authority for AFRCand ANG UE off-station trainers is HQ AFRC/DOOM. AMC, ANG, and AFRC units send an additional copy to TACC/XOB no later than 10 days prior to departure.

2.3. Aircraft Commander (AC) Responsibility and Authority. An AC is designated for all flights on the flight authorizations in accordance with AFI 11-401, *Flight Management* and applicable MAJCOM supplement. ACs are:

2.3.1. In command of all persons aboard the aircraft.

2.3.2. Responsible for the welfare of the crew and the safe accomplishment of the mission.

2.3.3. Vested with the authority necessary to manage crew resources and accomplish the mission.

2.3.4. The final mission authority and will make decisions not specifically assigned to higher authority.

2.3.5. The final authority for requesting or accepting any waivers affecting the crew or mission.

2.3.6. Charged with keeping the applicable C2 or executing agencies informed concerning mission progress.

2.3.7. Responsible for ensuring that only activity authorized by the executing authority is accomplished, unless emergency conditions dictate otherwise (for example, unscheduled “bootleg” air refueling is not authorized without the approval of the executing authority).

2.4. Mission Clearance Decision. The final decision to delay a mission may be made either by the executing agency or the AC when conditions are not correct to start or continue a mission. Final responsibility for the safe conduct of the mission rests with the AC. If the AC refuses a mission, the mission will not depart until the conditions have been corrected or improved so that the mission can operate safely. Another AC and aircrew will not be asked to take the same mission under the same conditions.

2.4.1. Rerouting or Diverting a Mission. Must be authorized by the execution authority, except in an emergency or when required by en route or terminal weather conditions.

2.4.1.1. The controlling agency directing the rerouting or diversion is responsible for ensuring the aircraft is compatible with departure, en route, and destination requirement and facilities.

2.4.1.2. The AC will notify the appropriate command center of any aircraft or aircrew limitation that may preclude diverting or rerouting the mission.

2.4.2. When directing an aircraft to an alternate airfield, the C2 center will ensure the aircraft commander is provided existing and forecast weather for the alternate, NOTAMs and appropriate airfield information from the ASRR. If the planned alternate becomes unsuitable while en route, the aircraft commander will coordinate with the C2 center for other suitable alternates. The C2 center will coordinate with customs and ground service agencies to prepare for arrival. The aircraft commander is final authority on selecting a suitable alternate.

2.5. Aircrew Responsibilities. The AC is the focal point for interaction between aircrew and mission support personnel. The local C2 center is the focal point for all mission support activities. ACs must inform C2 of any factor that may affect mission accomplishment. When transiting a stop without a C2 center, it is the responsibility of the AC to ensure necessary mission information is placed into the C2 system by the most expeditious means available. The AC will establish a point of contact with the appropriate C2 center prior to entering crew rest.

2.6. Operational C2 Reporting. AMC C2 centers will normally transmit arrival, departure, and advisory messages to the TACC, as appropriate. Aircrews on AMC-TACC controlled missions are responsible for transmitting these messages via SATCOM, HF, DSN, etc., when transiting stations without an AMC C2 (fixed or mobile) presence. Crews on missions not controlled by the TACC will report to their appropriate controlling agency.

2.6.1. High Frequency (HF) Communications. HF is the primary means of worldwide C2 communications.

2.6.2. Stations Without C2 Center Agencies. Report movement information (actual time of departure [ATD], estimated time of departure [ETD], actual time of arrival [ATA], departure load data, delay information, etc.) directly to the TACC (as appropriate) as soon as possible, by any means available. After takeoff, relay pertinent data to the appropriate C2 center by any means available.

2.6.3. Report movement information (departure, arrival, or diversion) and airlift mission recapitulation (recap) reports (number of passengers, pallets, tons of cargo, and special category information) to

the appropriate C2 centers via SATCOM or global HF stations. Provide relay instructions for global HF stations to pass reports to appropriate agencies.

NOTE: All HF transmissions will be restricted to operational traffic, i.e. movement reporting, itinerary revisions, maintenance status, flight plan information, etc.

2.6.4. En Route Reporting. On AMC missions, full time connectivity between C/KC-135s and the TACC is desired. Adhere to the following procedures:

2.6.4.1. CONUS. C2 agencies may advise aircrews via the controlling ATC agency to establish contact when communication is needed. Refer to the flight information publication (FLIP) concerning global HF station procedures in contacting MAINSAIL. Periodic "ops normal" calls or continuous monitoring of global HF station frequencies is not normally required. TACC may specify increased reporting procedures.

2.6.4.2. OCONUS. TACC will specify increased reporting procedures (if needed) through a communications plan in the OPLAN, OPORD, FRAG, or Mission Directive. Aircrews will transmit calls to global HF stations for relay to the controlling C2 agency as specified in the communications plan. Maintain listening watch on US Global HF system as specified in the communications plan.

2.6.5. Tanker Air Refueling Report. On AMC directed operational missions, provide the following information after completion of tanker A/R. Under normal circumstances, send only one off-load message, completed after the final A/R for the mission. Under abnormal circumstances such as receiver diverts, unsuccessful A/R, insufficient off-load, or anything else that impacts the over all success of the mission, a report is required as soon as practical. Use the following support:

2.6.5.1. Call sign.

2.6.5.2. Fuel off-loaded.

2.6.5.3. Mission status.

2.6.5.4. Next station.

2.6.5.5. ETA.

2.6.6. Receiver Air Refueling Report (N/A local training missions which depart and arrive at home station). Report the air refueling information (in the standard format indicated below) to the destination C2 Centers (if available) after landing. If a local AMC command post is not available, contact TACC/XOC (HILDA control) via HF radio or via landline (1-800-AIR-MOBL). AMC C2 Centers will enter the information in the GDSS system for immediate retrieval. Include all scheduled air refuelings not accomplished. Use the following format:

2.6.6.1. AR/Track.

2.6.6.2. Scheduled On-load.

2.6.6.3. Actual On-load.

2.6.6.4. Reason Code.

2.6.6.5. Additional Comments.

2.6.7. Reason Codes. Reason codes indicate the outcome of air refueling activity. Use Reason Codes when a problem or situation affects the successful accomplishment of the air refueling. Crew should

be prepared to provide a short synopsis of the factors impacting the air refueling. Applicable codes: **RO** - Receiver Operations, **RM** - Receiver Maintenance, **RW** - Receiver Weather, **TO** - Tanker Operations, **TM** - Tanker Maintenance, **TW** - Tanker Weather, **AT** - Air Traffic Control, **WEATHER** - Air Refueling Track Adverse Weather, **AC** - Air Refueling Complete.

NOTE: Use reason code "AC" when air refueling was completed without delay or mission impact. Additional comments are mandatory for all reason codes except AT, WEATHER, and AC.

2.6.8. Arrival Advisory.

2.6.8.1. HF Advisory. Aircrews on operational missions transmit HF arrival advisory to the destination C2 agency or, in the absence of a local C2 agency, to TACC when approximately 2-3 hours from destination. Furnish the following information:

2.6.8.1.1. Aircraft call sign.

2.6.8.1.2. Mission number.

2.6.8.1.3. ETB (estimated time in blocks).

2.6.8.1.4. Maintenance status. (See the definitions for a list of maintenance status codes in Attachment 1 of this AFI).

2.6.8.1.5. Distinguished visitor (DV) status and honors codes. (Transmit the DV code of each DV on board). Do not pass the name of the DV on board without the consent of the DV. Outside the continental limits of the United States, the name of the DV will not be passed over unsecure radios.

2.6.8.2. UHF/VHF Advisory. Aircrews transmit a UHF or VHF arrival advisory as soon as contact can be established with the destination C2 agency. The following information should be furnished:

2.6.8.2.1. Aircraft call sign.

2.6.8.2.2. Mission number.

2.6.8.2.3. ETB.

2.6.8.2.4. Maintenance status.

2.6.8.2.5. DV code and requirements.

2.6.8.2.6. Number of passengers.

2.6.8.2.7. Hazardous cargo and remote parking requirements.

2.6.8.2.8. Additional service required.

2.6.8.2.9. Number of pallets to be downloaded and number that are through manifested.

2.6.8.2.10. Passenger and pallet space and weight available for the next mission segment.

2.6.8.2.11. Fuel Requirements.

2.6.9. DV Messages. Airborne unclassified messages originated by DV passengers may be transmitted at the discretion of the AC.

2.6.10. Maintenance Discrepancy Reporting. Aircrews on AMC missions transmit maintenance discrepancies (via VHF, UHF, HF, or SATCOM) to destination C2 Center or, in the absence of a local C2

Center, to the TACC as soon as possible. Crews should not wait until accomplishing the arrival message to call in this information.

2.7. Mission Commanders.

2.7.1. A mission commander will be required when more than two aircraft are assembled to perform missions away from home station. With two aircraft, the tasked unit will designate an AC for overall mission responsibility, crew duties, and crew rest permitting. When conflicts with crew responsibilities exist, a separate mission commander should be appointed to ensure mission coordination is accomplished.

2.7.1.1. For AMC-tasked missions, TACC/XOO will coordinate and designate a lead-planning agency when more than one tanker unit is involved in an A/R operation. This planning agency is responsible for coordinating the entire mission with all involved tanker, receiver, and planning agencies. The lead-planning agency will designate the tanker mission commander. The mission commander will normally be the lead tanker AC for the entire mission.

2.7.1.2. For fighter movements, tasked units will coordinate the tanker support with the Air Combat Command (ACC) Air Operations Squadron (AOS) and provide tanker flight planning, based on the profile provided by the ACC AOS/AODX.

2.7.1.3. For all multi-ship-refueling operations, tasked units will ensure an appropriate level of ground and flight supervision is provided for the entire mission. Emphasis should be placed on who is the overall airborne commander and subordinate commanders for each type aircraft in the operation.

2.7.2. For refueling missions, the agencies responsible for mission tasking will coordinate a mission commander for all phases of the mission and ensure all participating aircrews are briefed and advised of mission commander assignment.

2.7.3. During MAJCOM AOS planned movements, the tanker mission commander is the final authority responsible for ensuring tanker aircrews have properly coordinated mission details for the deployment according to AFI 11-207, *Flight Delivery of Fighter Aircraft*.

2.7.3.1. Prior to entering crew rest for the mission, the mission commander will coordinate with the lead planning agency and the appropriate MAJCOM AOS delivery control officer (DCO). During this coordination, the mission commander will review mission itinerary and receive points of contact for the receivers and tankers to include any tankers which are non-collocated.

2.7.3.2. The mission commander will ensure all collocated aircrews complete required mission and formation briefings. The mission commander and all tanker aircrew members will attend the appropriate MAJCOM AOS/DCO pre-takeoff briefing. The aircraft commander may excuse boom operators from required briefings if they are needed to upload/download cargo. Tanker specific information must be briefed in the pre-takeoff briefing to ensure all takeoff, formation, en route, A/R, and recovery requirements are coordinated between tanker and receiver aircraft.

2.7.3.3. When non-collocated tankers and receivers are involved, the mission commander (in conjunction with the lead-planning agency) will ensure all applicable information, to include rendezvous, formation, abort, and recovery procedures, is relayed to non-collocated aircrews. The mission commander will ensure the controlling agency and all non-collocated tankers and receivers are informed of all anticipated delays or mission changes.

2.8. DUAL ROLE Procedures. (N/A PACAF unless on AMC-directed mission.)

2.8.1. DUAL ROLE is a term describing mobility missions where both A/R and airlift are provided to the user. Primary mission role is normally A/R. Missions where cargo movement is primary require a dedicated funded SAAM.

2.8.2. A valid DUAL ROLE must satisfy the following:

2.8.2.1. The user must have a MAJCOM validated A/R requirement. Validated requirement must be received by TACC/XOOK or AMOCC NLT 14 days prior to mission start date to ensure proper mission support.

2.8.2.2. The user must have a MAJCOM validated and TACC or AMOCC approved cargo requirement of at least 2 pallets of cargo, not including baggage.

2.8.3. Since the DUAL ROLE mission is primarily an A/R mission, the A/R requirement must be met first without regard to protecting ancillary cargo capability.

2.8.4. DUAL ROLE ancillary cargo capability is not contractual or guaranteed in any way. Additional tanker sorties or hours will not be expended to refuel the DUAL ROLE KC-135 (i.e. FORCE EXTENSION) solely for protecting ancillary cargo capability.

2.8.5. DUAL ROLE requests that require excessive KC-135 positioning or de-positioning time will not normally be supported unless effective KC-135 aircrew training can be accomplished on positioning and de-positioning legs.

NOTES:

For AFRC and ANG missions, unit identified training needs should be considered in justifying positioning and de-positioning time.

Exceptions may be granted by MAJCOM/DO for missions that do not meet these criteria but reduce total fiscal cost, do not impact other tanker requirements, and present the most practical means available.

2.9. C2 Agency Telephone Numbers. Units should publish an maintain a listing of key telephone numbers to assist crews in coordinating mission requirements through appropriate C2 agencies. The listing should be made readily available to crews by publishing it in the FCB, Read File, or other unit level publication.

2.10. Close Watch Missions. Close Watch missions are designated missions (*e.g. CSAR; Medevac, PHOENIX BANNERs*) which receive C2 special attention. Close Watch procedures are initiated so all possible actions are taken to ensure on-time accomplishment and notification to the user when delays occur or are anticipated. Promptly notify the appropriate C2 channels of delays, aborts, or other events affecting on-time departure and advise them of the ETIC, new ETD, and ETA. Notify the C2 within 10 minutes of event and confirm the user and OPR have been advised.

2.11. Boeing C/KC-135 Inflight Emergency Support. Boeing provides 24-hour support for C/KC-135 in-flight emergencies. To use this service: obtain a phone patch to one of the numbers listed below, tell the operator you have an “INFLIGHT EMERGENCY” and identify the base or location in which the

phone patching is established. **These numbers are only to be used for in-flight emergency support: DSN 743-5687, Commercial: 800-721-0422 or 206-655-9200.**

Chapter 3

CREW MANAGEMENT

3.1. Aircrew Qualification. Primary crewmembers or those occupying a primary position during flight must be qualified or in training for qualification for that crew position. If non-current, or in training for a particular event, the crewmember must be under the supervision of an instructor while accomplishing that event (direct supervision for critical phases of flight).

Exception 1: Senior staff members who have completed the Senior Staff Course (A004) may occupy either pilot seat under direct IP supervision. These individuals will log "FP" for Flight Authorization Duty Code on the AFTO Form 781.

Exception 2: AETC instructor pilots in the AETC Instructor Enrichment Program may fly under the direct supervision of a qualified CCTS/FTU instructor. No simulated emergencies will be performed.

3.1.1. Pilots:

3.1.1.1. Missions With Passengers. With passengers on board, takeoff, climb-out, flight under actual instrument conditions may be made by either the pilot or copilot. Only a pilot that is qualified current and valid AF Form 8, **Aircrew Certification of Qualification,** will occupy a pilot's seat with passengers onboard the aircraft. One of the following conditions must be met:

3.1.1.1.1. Two qualified and current pilots must be at the controls. Or,

3.1.1.1.2. A pilot regaining currency and an IP providing direct IP supervision must be at the controls.

3.1.1.2. Touch-and-go landings with passengers are prohibited. Civilian employees under direct contract to the DoD and MAJCOM approved maintenance personnel engaged in official direct mission support activities are considered mission essential and may be onboard when touch-and-go landings are performed under MEGP status.

3.1.1.3. Left Seat Training. Experienced copilots, current and qualified in the right seat, may be allowed to fly in the left seat under direct IP supervision. No passengers may be onboard.

3.1.2. Other Crewmembers. Non-current or unqualified navigators or boom operators may perform in their primary crew position on any mission when supervised by a qualified instructor of like specialty.

3.2. Crew Complement. Minimum crew complement for basic and augmented FDP are **Table 3.1.** For Pacer CRAG (PC), the commander may designate a mission to use 4-person procedures if the complexity or priority dictates, or to meet navigator or other crew position currency/training requires.

Table 3.1. Crew Complement.

Position	Basic	Augmented	PC 3-Person Basic (4)	PC 3-Person Augmented (4)	PC 4-Person Basic	PC 4-Person Augmented	Notes
AC	1	2	1	2	1	2	(1)
CP	1	1	1	1	1	1	
NAV	1	2	N/A	N/A	1	2	

Position	Basic	Augmented	PC 3-Person Basic (4)	PC 3-Person Augmented (4)	PC 4-Person Basic	PC 4-Person Augmented	Notes
FE	1	2	N/A	N/A	N/A	N/A	
BO	1	2	1	2	1 (5)	2 (5)	(2)(3)
CSO*	1	2	N/A	N/A	N/A	N/A	
FA**	1	2	N/A	N/A	N/A	N/A	

*Communications Systems Operators (EC-135N)
**Flight Attendant (EC-135N)
Table 3.1. Notes:
1. Both ACs must be current and qualified in the model -135 they are flying (and PC, if applicable).
2. One boom operator satisfies augmented crew requirements for EC-135N aircraft (includes missions with KC-135R substituting for EC-135N).
3. An extra boom operator should be added to the crew during scheduled cargo missions when cargo-loading time impacts normal crew duty times.
4. Pacer CRAG 3-Person operations, anytime passengers are carried, an additional crewmember must be added to the crew to act as passenger monitor.
5. Pacer CRAG 4-Person operations, the boom operator need not be Pacer CRAG certified/qualified.

3.2.1. Minimum crewmembers for local flights are the pilot and copilot. Additional primary crewmembers are the navigator and boom operator. Navigator position may be filled by qualified Third Pilot (3P) or Navigation Systems Operator (NSO) (not applicable to Pacer CRAG operations). Required crewmembers for a mission will be determined by the Sq/CC.

3.2.2. Augmented crews are required when a mission cannot be safely completed within a basic FDP. Augmentees must be current, qualified, and mission ready (MR) in accordance with AFI 11-2KC-135V1, *C/KC-135 Aircrew Training*. ***Exceptions***: A non-mission ready (NMR) pilot may be used as an augmentee if accompanied by two fully qualified, MR IPs. A NMR boom operator may be used as an augmentee if accompanied by a fully qualified MR IBO. The NMR boom operator must be qualified to perform that specific mission (i.e., cargo qualified, fighter qualified, etc.). In those situations requiring augmentation, the crew must be augmented from the start of the duty period. MAJCOM/DO approval is required for additional crewmembers to join the mission en route for augmentation. If augmentees are added to the crew, the crew's FDP will be computed based on the FDP of the most limited person.

3.2.3. When more than 10 passengers are carried, an extra crewmember, knowledgeable in passenger procedures, will be assigned to the mission.

3.3. Scheduling Restrictions. Crewmembers will not be scheduled to fly nor will they perform crew duties:

3.3.1. When the maximum flying time limitations of AFI 11-202, Volume 3 will be exceeded.

3.3.2. After consuming alcoholic beverages within 12 hours of takeoff or when under the influence of alcohol.

3.3.3. Do not takeoff early (prior to scheduled departure time) if the early takeoff time would violate these restrictions.

3.3.4. After consuming alcoholic beverages within the 12-hour period prior to assuming ALFA/ BRAVO standby force duty.

3.3.5. Within 72 hours of donating blood. The flying unit commander must approve the donation of blood by crewmembers in a mobility assignment or who are subject to flying duties within this 72 hour period. Crewmembers should not normally donate blood.

3.3.6. When taking oral or injected medication unless individual medical waiver has been granted by the Command Surgeon. Crewmembers may not self medicate except IAW AFI 48-123, *Medical Examinations and Standards.* The following is a partial list of medications that may be used without medical consultation:

3.3.6.1. Skin antiseptics, topical anti-fungals, 1 percent Hydrocortisone cream, or benzoyl peroxide for minor wounds and skin diseases which do not interfere with the performance of flying duties or wear of personal equipment.

3.3.6.2. Single doses of over-the-counter aspirin, acetaminophen or ibuprofen to provide analgesia for minor self-limiting conditions.

3.3.6.3. Antacids for mild isolated episodes of indigestion.

3.3.6.4. Hemorrhoidal suppositories.

3.3.6.5. Bismuth subsalicylate for mild cases of diarrhea.

3.3.6.6. Aircrew as “get me downs” may use oxymetazoline or phenylephrine nasal sprays should unexpected ear or sinus block occur during flight. These should not be used to treat symptoms of head congestion existing prior to flight.

3.3.7. Within 24 hours of compressed gas diving (including scuba); surface supplied diving, or hyperbaric (compression) chamber exposure and aircraft pressurization checks that exceed 10 minutes duration.

3.3.8. Within 12 hours after completion of a hypobaric (altitude) chamber flight above 25,000 feet. Personnel may fly as passengers in aircraft during this period, provided the planned mission will maintain a cabin altitude of 10,000 feet MSL or less. For chamber flights to a maximum altitude of 25,000 feet or below, aircrew members may fly without delay as crewmembers or passengers if their cabin altitude does not exceed 15,000 feet.

3.4. Alerting Procedures.

3.4.1. Crew alerts will normally be 4+15 hours prior to scheduled takeoff time to allow 1 hour for reporting and 3+15 hours for mission preparation. Self-alert procedures may be used for normal local training missions, timing will be in accordance with local directives.

3.4.1.1. Self-alerting may be requested by the AC, but is not normally recommended on operational missions to avoid potential crew duty limitations resulting from mission changes. Units may give blanket authorization for self-alerting on local missions. Early alerting to provide additional reporting or mission preparation time is authorized when absolutely essential for mission accomplishment. Late alerting is also authorized; however, all requests for changes to standard alerting times must be coordinated through the appropriate C2 center.

3.4.1.2. If no controlling C2 agency is available, crews will self-alert.

3.4.1.3. With AC approval, boom operators may be alerted early when loading requirements (i.e. outsized cargo and dash 9 section 5 cargo) dictate a need for early alerting but no more than 2 hours prior to the crew alert. If early alerting will be required, the boom operator must be notified of that intent prior to entering crew rest. In no case should the boom operator be alerted more than 1 hour prior to the commencement of actual cargo loading operations. ACs and C2 must consider when the boom operator reports early, the available flight duty period for the crew will be limited by the boom operator's show time.

3.4.2. A crew will not be alerted until the aircraft is in commission or there is reasonable assurance that the estimated time in commission (ETIC) will meet the proposed takeoff time.

3.4.3. The AC may request crew enhancement crew rest (CECR) when desiring a later legal for alert time to normalize the crew work-rest cycle or enhance messing options immediately prior to crew alert. To minimize adverse effects on established schedules, aircraft flow, and capability, CECR requests should be of minimum duration and normally be limited to de-positioning legs. Send requests through C2 channels for approval decision. When requests are disapproved, the controlling C2 agency will notify the AC through C2 channels of the reason for disapproval. CECR is not an alternative to a 'safety of flight' delay and should not be used as such. If the AC deems extra crew rest is necessary for continued safe flight and mission accomplishment, the AC has the responsibility to declare safety of flight when the situation warrants, not after CECR is disapproved.

3.4.4. Aircrew release policy is as follows:

3.4.4.1. On the aircrew's initial entry or reentry into crew rest, the controlling C2 agency (or AC during self-alerts) will establish an expected alert time. The crew will not be alerted or otherwise disturbed before this time except for emergencies.

3.4.4.2. The latest allowable alert time will be 6 hours after the expected alert time for all missions. If circumstances warrant, the AC may extend the window to a maximum of 8 hours. (When advised the crew will be deadheading, the AC may extend the window to 12 hours.) Air Reserve component (ARC) crewmembers may extend the window as necessary to allow deadhead return to home station by the scheduled return date (SRD). The controlling C2 agency will not request the aircrew accept more than a 6-hour window.

3.4.4.3. If the controlling C2 agency determines a crew will not be alerted in the allowable time span, then at the time of determination (but no earlier than the crew's expected alert time) the controlling C2 agency will reenter the crew into crew rest of not less than 12 hours and establish a new expected alert time.

3.4.4.4. When the latest allowable alert time expires without being alerted, then: (1) The crew reenters crew rest of not less than 12 hours, and (2) The AC will contact the controlling C2 agency to determine the new expected alert time and establish a new latest-allowable alert time.

3.5. Stage Management.

3.5.1. Stage Posture. Stages operate on a directional basis. Alert sequence is as follows: (1) Crews requiring an emergency return to home station, (2) By the crew's SRD. Returning stage crews will be prioritized by their SRD, (3) Crews in stage over 48 hours, (4) Crews in sequence of arrival time.

NOTE: If a stage crew is forced to return to crew rest because of a mission delay or abort, that crew becomes first out when legal for alert.

3.5.2. Mechanical Stage. Mechanical stages may be established by the C2 center where no crews are staged. The stage is created when a mission is delayed or aborted and the crew goes into crew rest. Mechanically staged crews become first out in the same direction when legal for alert. An inbound crew may be bumped from the mission even though they have sufficient duty time remaining to complete that mission. ***EXCEPTION:*** AFRCand ANG crews flying unit-equipped aircraft should not normally be mechanically staged.

3.6. Crew Duty Time (CDT) and Flight Duty Period (FDP). CDT is the amount of time an aircrew may perform combined flight and ground duties. FDP is the time period between mission reporting and final aircraft engine shutdown. For planning purposes, CDT normally consists of FDP plus 45 minutes, not to exceed the maximum CDT. When post flight duties exceed 45 minutes, CDT is FDP plus the time required to complete the post-flight related duties.

3.6.1. CDT and FDP both begin 1 hour after alert.

EXCEPTIONS. Self-alerts - CDT and FDP begin at scheduled or established mission reporting time. ALFA standby - CDT and FDP begin when the crew is told to launch. BRAVO standby - CDT and FDP begin when the crew shows for duty. When crewmembers perform other duties prior to flight related duties - CDT and FDP begin when reporting for other duties.

3.6.2. The mission directive or controlling C2 center will establish the length of FDP when the crew shows for duty and is briefed for the mission. FDP will not be extended to an augmented day after a basic FDP has begun regardless of crew composition. FDP will not be based on crew composition, but rather on mission requirements.

3.6.3. FDP ends at engine shut down following completion of the final mission segment.

NOTE: FDP/CDT includes both military duty and civilian work and begins when the reporting for the first duty period (military or civilian).

3.6.4. Normally, CDT ends 45 minutes after engine shutdown at the end of the mission. If any crewmember must perform mission-related duties beyond 45 minutes, CDT does not end until that crewmember completes these duties. These duties include up or down loading, servicing, debriefing, mission planning, etc. Except when authorized by unit commanders at home station or deployed locations, after mission completion crewmembers will not be used for duties supporting other missions; i.e., crew boom operators will not be used as loading supervisors for other aircraft. Post mission duties will not be performed after the maximum CDT has expired.

3.6.5. Basic Crew FDP.

3.6.5.1. Maximum FDP for a basic crew is 16 hours. The basic FDP is 12 hours without an operative autopilot altitude hold. The basic FDP for Pacer CRAG 3-Person operations is 12 hours when the autopilot can not be coupled to the FMS.

3.6.5.2. Maximum CDT for a basic crew is 18 hours.

3.6.6. Augmented Crew FDP.

3.6.6.1. Maximum FDP for an augmented crew (operational missions only) is 24 hours. FDP is 16 hours without an operative autopilot altitude hold. For Pacer CRAG 3-Person operations, FDP is 16 hours when the autopilot can not be coupled to the FMS. In both cases, only the pilot portion of the crew need be augmented.

3.6.6.2. Basic crews will not be augmented after FDP has started. ***EXCEPTION:*** See paragraph **3.2.2.**

3.6.6.3. Maximum CDT for augmented crews is 24 hours and 45 minutes.

3.6.6.4. Authorized only for a maximum of four intermediate stops and when one of the following criteria is met: (1) At least two legs of 4 hours each, (2) At least one leg of 6 hours.

NOTE: No more than two intermediate stops are authorized past 16 hours.

3.6.7. Training FDP:

3.6.7.1. Maximum FDP for training missions is 16 hours.

3.6.7.2. Transition training must be completed during the first 12 hours of the FDP. ***EXCEPTION:*** Flight evaluations.

NOTE: AFRC and ANG crews may perform transition on training missions provided time from start duty does not exceed 16 hours and actual flight duty does not exceed 12 hours.

3.6.8. If autopilot fails after departure, or the autopilot fails to couple to the FMS during Pacer CRAG 3-Person operations, consider mission requirements and determine best course of action to preclude further mission delays due to reduced FDP. Best course of action may include divert to an airfield with maintenance capability. Contact C2, coordinate intentions, and comply with the preceding limitations upon reaching the next destination.

3.6.9. Deadhead Time. Duty time for crewmembers positioning or de-positioning for a mission or mission support function.

3.6.9.1. Crewmembers may perform primary crew duties after deadheading, if they will not exceed a basic FDP for the mission to be flown, beginning at reporting time for the deadhead flight.

3.6.9.2. Crewmembers may deadhead following primary crew duties if they will not exceed an augmented FDP beginning at reporting time for primary crew duties.

3.6.10. CDT/FDP Extensions. On operational missions, after considering the safety and capability of their crew and when mission priority justifies the risk, aircraft commanders may extend the maximum basic crew FDP up to 2 hours. On AMC missions, regardless of the aircrew's assigned MAJCOM, waiver authority for any extensions to an augmented FDP/CDT, extensions to a basic FDP/CDT in excess of 2 hours, or for waivers anticipated prior to mission execution, is the AMC/DO, IAW AFI 11-202, Vol. 3.

3.6.11. Flight examiners administering evaluations will not exceed an augmented FDP.

3.7. Crew Rest. Crewmembers will enter crew rest a minimum of 12 hours prior to alert time or, when self alerting, 12 hours prior to reporting time. MAJCOM/DO may waive all or any part of a crew rest period IAW AFI 11-202, Vol. 3. This waiver will normally accompany high priority air refueling and airlift tasks or a change in unit readiness.

3.7.1. Home-Station Pre-departure Crew Rest. All primary and deadhead crewmembers should enter crew rest 24 hours before planned alert time for missions scheduled away from home station for more than 16 hours. Crewmembers may perform limited non-flying duties, including mission planning, etc. during the first 12 hours of this period. OG/CC is waiver authority for the first 12 hours of Pre-depar-

ture Crew Rest. Deadhead crewmembers will not be manifested as passengers to reduce or eliminate crew rest requirements. ***EXCEPTION:*** AFRCand ANG in accordance with AFI 11-202, Volume 3 and appropriate supplement.

3.7.2. En route Crew Rest and Ground Time.

3.7.2.1. Crew rest normally begins 45 minutes after final engine shutdown. The 45-minute time period provides crews with time to complete normal post-flight duties. These duties include, but are not limited to, refueling, uploading and downloading of cargo, performing maintenance, or completing mission debriefings.

3.7.2.2. If any crewmember must stay at the aircraft past the 45-minute period, crew rest does not begin until post-flight duties are completed.

3.7.2.3. Minimum crew rest period is 12 hours. This period provides the crew a minimum of 8 hours of uninterrupted rest plus time for transportation, free time, and meals. The crew will not be disturbed during this period, except during emergencies. Should the 12-hour crew rest period be infringed upon by official duties, the crew will enter crew rest for an additional 12 hours on completion of official duties.

3.7.2.4. A minimum 17-hour ground time between engine shutdown and mission takeoff should normally be planned unless extended post flight duties are anticipated. For DUAL ROLE missions, or for cargo missions without rollers with a cargo download or upload, 18+15 hours should normally be planned. This allows for cargo loading operations upon arrival and 3+15 hours show for departure.

3.7.2.5. The AC may modify normal ground time.

3.7.2.5.1. In the interest of safety.

3.7.2.5.2. To no less than 12 hours from the start of crew rest until mission reporting. Before reducing normal ground time consider mission preparation time, time to load cargo, and other factors peculiar to the mission. The controlling C2 agency will not ask the AC to accept less than a normal ground time. Waivers for exercises and contingencies are according to AFI 11-202, Vol. 3.

3.7.2.5.3. To a maximum of 36 hours, when the crew has completed three consecutive near maximum FDPs.

NOTE: Flight crews should be afforded crew rest times in excess of the minimum at en route stations, when possible, to give crews the opportunity to overcome the cumulative affects of fatigue while flying on several consecutive days or transiting several time zones.

3.7.3. Post-Mission Crew Rest (PMCR), PMCR is not applicable to ANG and AFRC crews.

3.7.3.1. Crewmembers, returning to their home base, will be given sufficient time to recover from the cumulative effects of their deployed mission and tend to personal needs. PMCR begins immediately on mission termination.

3.7.3.2. Provide one hour of PMCR time (up to a maximum of 96 hours) for each three hours TDY when the duty exceeds 16 hours away from home-station. This time is in addition to and will not run concurrently with pre-departure crew rest. (Not applicable to continuing missions.)

3.7.3.3. The OG/CC or acting representative is designated PMCR waiver authority and will not delegate this authority below the OG/CC level. Limit PMCR waivers to extraordinary circumstance only and must not be used for day-to-day operations.

3.7.4. Crews will reenter crew rest if their aircraft or mission (training or operational) is not capable of departure within 4 hours from scheduled takeoff time. Exceptions will be granted only with the concurrence of the AC.

3.7.5. Flying Crew Chief Work and Rest Plan. The crew chief is responsible to the AC. The AC, in conjunction with the en route station chief of maintenance, will determine how long the crew chief can safely perform aircraft recovery actions. The crew chief must have the opportunity to sleep 8 hours in each 24-hour period. See AFI 21-101, *Maintenance Management of Aircraft,* for detailed guidance.

3.7.6. Crew rest waivers approved for exercises and contingencies will be published in the OPORD, OPLAN, or CONOPS.

3.8. Standby Force Duty. (Not applicable for AFRC, ANG and PACAF)

3.8.1. Types of Standby Forces.

3.8.1.1. ALFA Standby Force. An aircraft and aircrew capable of launching in 1 hour. Crewmembers are given 12 hours of pre-standby crew rest before or after aircraft preflight. Aircrews must complete all preflight duties within 6 hours of crew show time. An additional 12-hour pre-standby crew rest is required when preflight time exceeds 6 hours. Once an ALFA force is formed, additional pre-flights may be necessary to maintain the ALFA aircraft. Additional pre-flights done during normal waking hours do not interrupt crew rest. A crew will not stay on ALFA standby duty for more than 48 hours. After 48 hours, the crew must be launched, released, or entered into pre-departure crew rest.

3.8.1.2. BRAVO Standby Force. An aircraft or aircrew capable of launching in 3 hours (from the time the unit is told to launch). Crewmembers are given 12 hours of pre-standby crew rest. Crews are legal for alert after pre-standby crew rest. Preflight duties, if required, interrupt crew rest. A crew will not stay on BRAVO standby duty for more than 48 hours. After 48 hours, the crew must be launched, released, or entered into pre-departure crew rest. If a crew is pre-flighting when the unit is tasked to launch the mission, CDT will begin when the crew first reported for that duty.

3.8.1.3. CHARLIE Standby Force. An identified aircrew capable of entering crew rest within 2 hours (after their controlling unit is notified). This aircrew would become legal for alert 12 hours after entering crew rest. Charlie alert will not exceed 72 hours. If retained for a 72-hour period, crewmembers will be released for 12 hours before resuming CHARLIE Standby Force duty, entering crew rest for mission, or entering pre-standby crew rest for ALFA or BRAVO Standby Force duty.

3.8.1.4. Wing Standby Forces. Unit commanders establish standby forces. Crewmembers are given normal pre-departure crew rest. Standby duty time is limited to 12 hours. Crews will receive at least 12 hours of crew rest prior to another 12 hours of standby duty.

3.8.2. Standby Force Crew Management.

3.8.2.1. Commanders will not use a standby crew to preflight other than their standby aircraft, or to do any non-mission duties while on standby.

3.8.3. Post-Standby Missions. On completion of standby duty, aircrew members may be dispatched on a mission.

3.8.3.1. Standby duty and pre-departure crew rest may be concurrent if notification is provided at least 12 hours prior to alert.

3.8.3.2. If started, post-standby crew rest must be completed before the start of pre-departure crew rest.

3.8.3.3. If an aircrew member is dispatched on a mission, compute the post-mission crew rest time on standby time plus mission time.

3.8.4. Post-Standby Crew Rest. Aircrew members not dispatched on a mission following standby duty will receive post-mission standby crew rest as follows:

3.8.4.1. If standby duty is performed away from normal quarters, crew rest time is computed from this standby time on the same basis as for mission time.

3.8.4.2. If standby duty was performed in normal quarters, no crew rest time is authorized.

3.8.5. ALFA Standby Aircraft Security. Each unit will complete a maintenance and aircrew preflight inspection when they put an aircraft on ALFA standby status. The AC will ensure the aircraft is secured before entering crew rest. Secure all hatches and doors to show unauthorized entry. Close and lock the crew entrance door with the lock box or other controllable device, which will prevent entry without damage to the door or lock. The command post must grant permission prior to persons entering an aircraft once the plane is sealed. Ensure standby aircraft is resealed any time the aircraft has been opened. The AC or designated representative must be present if access to their assigned aircraft is required.

3.9. Orientation Flights and Incentive Flights. Refer to DoD 4515.13-R, AFI 11-401, *Flight Management*, and the appropriate MAJCOM supplement.

3.10. Interfly.

3.10.1. Interfly is the exchange and/or substitution of aircrew members and/or aircraft between mobility units to accomplish flying missions. OG/CC, or as specified in the appropriate MAJCOM supplement (ANG use ANG/XO approval-level and AFRC use AFRC/DO approval-level) may authorize the interfly of assigned aircrews and/or aircraft. Normally, interfly should be limited to specific operations, exercises, or special circumstances but, may be used to relieve short-term qualified manpower shortfalls. During contingencies, exercises, or designated “interfly” missions, interfly operations will be conducted under the following conditions or as specified in the OPLAN or CONOPS.

3.10.2. When approved, interfly during normal day-to-day operations under the following conditions:

3.10.2.1. Aircraft ownership will not be transferred.

3.10.2.2. As a minimum, crews will be qualified in the MDS and model as well as systems or configuration required to fly the aircraft and/or mission.

3.10.2.3. During interfly, crewmember(s) will follow "basic" operational procedures (see Combined Operations, paragraph **1.5.1.**) and must thoroughly brief MAJCOM-Specific items.

3.10.2.4. Initiate interfly approval request by the unit or agency requesting the agreement my memo or message format to the OG/CC controlling the resource. Each commander involving resources (personnel or aircraft) (or MAJCOM, if appropriate) must concur with interfly proposal. Request must include details of the deployment or mission including; aircrew name(s), duration, or special circumstances.

3.10.2.5. Flight Mishap accountability is MAJCOM designated by PEID code for mishap aircraft.

3.10.2.6. Ground Mishap accountability in accordance with AFI 91-204, *Safety Investigations and Reports*.

Chapter 4

AIRCRAFT OPERATING RESTRICTIONS

4.1. Objective. The ultimate objective of the aircraft maintenance team is to provide an aircraft for launch with all equipment operational (Fully Mission Capable, FMC). Manpower limitations, skills, and spare part availability have a negative and direct impact on accomplishment. However, some redundant systems allow safe operation with less than all equipment operational for certain missions under specific circumstances. The AC, using the following policies, determines an aircraft's overall status. Use the following maintenance identifiers to effectively communicate an aircraft's status:

4.1.1. Mission Essential (ME). An item, system, or subsystem component essential for safe aircraft operation or mission completion will be designated Mission-Essential (ME) by the AC in AFTO Form 781A, **Maintenance Discrepancy and Work Document**. Include a brief explanation of the reason for ME status in the AFTO Form 781A discrepancy block. An AC accepting an aircraft (one mission or mission segment) without an item or system does not commit that AC (or a different AC) to subsequent operations with the same item or system inoperative.

4.1.2. Mission Contributing (MC). Any discrepancies that are not currently ME, but may become ME (if circumstances change), are designated as MC in the AFTO Form 781A discrepancy block. Every effort will be made to clear the MC discrepancies at the earliest opportunity to the extent that maintenance skills, ground time, and spare part availability permit. If subsequently, in the AC's judgment, mission safety would be compromised by the lack of any component, he may re-designate the said component as ME. However, do not delay a mission to correct an MC discrepancy.

4.1.3. Open Item. Discrepancies not expected to adversely impact the current mission or any subsequent missions are not designated MC or ME. These items receive low priority and are normally worked at home station. Do not accept an aircraft from factories, modification centers, or depots unless all instruments are installed and operative.

4.1.4. Engine performance, aircraft attitude, vertical velocity indications, altitude, speed, and heading instruments should be operative in both pilot positions (for Pacer CRAG, independent attitude and heading sources should be operative in both pilot positions). For instruments with both analog and digital displays, either the analog or digital presentation is acceptable.

4.2. Policy. It would be impractical to prepare a list that would anticipate all possible combinations of equipment malfunction and contingent circumstances. This chapter list the equipment and systems considered essential for routine as well as contingency operations. The list does not necessarily include all equipment or systems essential to airworthiness (e.g. rudder, ailerons, elevators, flaps, tires, etc.). Those items, which state a minimum requirement and have no listed exceptions, are grounding items.

4.2.1. The AC is responsible for exercising the necessary judgment to ensure **no aircraft is dispatched with multiple items inoperative** that may result in an unsafe degradation and/or an undue increase in crew workload. The possibility of additional failures during continued operation with inoperative systems or components shall also be considered. This chapter is not intended to allow for continued operation of the aircraft for an indefinite period with systems/subsystems inoperative.

4.2.2. If, after exploring all options, an AC determines a safe launch is possible with an item inoperable (beyond a particular restriction) the AC shall request a waiver. Use C2 channels to notify the appropriate execution agency of intentions. Plan a minimum 1-hour response to the waiver request.

4.3. Waiver Protocol. Waiver to operate with degraded equipment or waiver to USAF policy exceeding this chapter may be granted on a case-by-case basis and only in exceptional circumstances. Waiver authority is based on "who" has operational control and execution of the aircraft performing a specific mission. The Aircraft Commander determines the need for a waiver, and initiates the request. If waiver process, authority, or protocol is in doubt--contact the TACC (appropriate cell).

4.3.1. Local Missions (executed by unit OG/CC or equivalent). Waiver authority for active duty units flying local missions is the active duty OG/CC or equivalent. For associate AFRC units, waiver authority is the active duty OG/CC or equivalent. For Unit Equipped (UE) AFRC or ANG units, waiver authority is the ARC OG/CC or equivalent.

4.3.2. AMC-Directed Missions. Waiver authority for active duty and AFRCor ANG units flying AMC or AMC-directed missions controlled by the AMC/TACC (includes HQ AMC Operational Readiness Inspections) is HQ AMC/DO. HQ AMC/DOV personnel are the authorized agent and maintain 24-hour watch through the appropriate TACC cell (East or West).

4.3.3. ARC-Directed Missions (executed by the ANG or AFRC). The appropriate ARC headquarters maintain C2 and waiver authority for ARC crews performing any ARC-directed mission prior to mobilization (except associate AFRC units); waivers must be obtained from ANG/DO or HQ AFRC/DO, as appropriate.

4.3.4. Other Missions (Contingencies). Waiver authority is listed in the OPORD/Tasking Order, etc., or the DIRMOBFOR (or equivalent) for the agency with C2 of the aircraft. Crewmembers may request additional assistance or confirmation from their home units or MAJCOM/DO through the TACC, as specified in the MAJCOM supplement.

4.3.5. Non-AMC Missions. For aircraft identified as belonging to user-commands according to Air Force Policy Directive (AFPD) 10-9, e.g., AETC, ACC, PACAF, USAFE, etc., waiver authority is the appropriate MAJCOM/DO or as specified.

4.4. Technical Assistance Service. The AC may request (at anytime in the decision process) technical support and additional assistance from their home unit, MAJCOM staff, and maintenance representatives.

4.4.1. ACs electing to operate with degraded equipment or aircraft systems (with appropriate waiver) must coordinate mission requirements (i.e. revised departure times, fuel requirements, maintenance requirements, etc.) with the controlling C2 agency prior to flight.

4.4.2. When it is necessary to protect the crew or aircraft from a situation not covered by this AFI and immediate action is required, the AC may deviate from this chapter. Report deviations (without waiver) through channels to appropriate MAJCOM/DO within 48 hours. Units must be prepared to collect background information and submit a follow-up written report upon request.

4.5. Supplements. MAJCOMs and units may supplement the MEL.

4.6. Single-Integrated Operations Plan (SIOP). Use the SIOP no-go checklist.

4.7. Three-Engine Ferry Operations (KC-135E/R/T). Consider three-engine ferry operations only after exhausting all other options to return an aircraft with an inoperative engine to full mission ready status. Each three-engine ferry sortie must be approved by MAJCOM/DO. The owning MAJCOM will provide execution authority for these sorties. As directed by the appropriate MAJCOM only specially trained and designated crewmembers from NAF/DOV or OG/OGV will conduct three-engine ferry flights. The following procedures apply:

4.7.1. Plan ferry operations well ahead to allow sufficient time for completion of maintenance preparation actions.

4.7.2. Plan the flight to the nearest destination possessing a usable maintenance support capability. Obtain clearances and alert all en route, alternate, and abort bases along the intended route of flight.

4.7.3. Use the minimum crew necessary for the ferry operation. A qualified boom operator and a maximum of two crew chiefs (one 7-skill level) may be added. Do not carry passengers or other non-essential personnel. Observe aircraft flight manual limitations.

4.7.4. All primary aircraft systems not associated with the failed engine must be fully operational.

4.7.5. Performance data must satisfy takeoff field length requirements, gear down 3-engine climb performance, and final segment two-engine asymmetric go-around capability.

4.7.6. Download cargo (including mission support kits) prior to ferry operations. Return all cargo and support equipment to the main operating base of assignment via organic support aircraft or other airlift means.

4.8. Power Management Control (PMC) Operations. The AC may (authorize) takeoff with one PMC inoperative. Do not turn off an operational PMC to practice a PMC inoperative takeoff. Simulated three-engine approaches and touch-and-go landings are not authorized with a PMC inoperative.

4.9. MINIMUM EQUIPMENT LIST (MEL).

4.9.1. Policy. The MEL's in the following tables list the minimum equipment and systems to launch the aircraft under normal conditions. The MEL represents MAJCOM restrictions only and does not include all equipment or systems essential to airworthiness, e.g., rudder, elevator, flaps, ailerons, tires, etc.

4.9.1.1. The aircraft commander is responsible to exercise the necessary judgment to ensure **no aircraft is dispatched with multiple items inoperative** that may result in an unsafe degradation and/or an undue increase in crew workload. The exposure to additional failure during continued operation with inoperative systems or components must also be considered. This volume is not intended to provide for continued operation of the aircraft for an indefinite period with systems/subsystems inoperative.

4.9.2. For instruments with both analog and digital displays, either the analog or digital presentation is acceptable.

4.9.3. System components required to complete emergency procedures as specified by the flight manual and associated warning systems will be operational.

4.9.4. Aircraft Model Identification. The tables apply to the C/KC-135/E/R/T model aircraft. Specific aircraft information is identified with **(R)** to indicate KC-135R or T model aircraft and **(E)** to

indicate KC-135E model aircraft. Specific information for aircraft modified with TCTO 1433, Pacer CRAG **(PC),** are listed in tables 4.16 through 4.23, with requirements for both 3-Person (3P) and 4-Person (4P) operations. For tables 4.16 through 4.21, CBIT 1 is the leftmost bit in the display.

Table 4.1. Engines/Auxiliary Power Unit (APU).

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Engines	4	4	Do not take off with non-standard aircraft configuration or power unless a hostile threat to the aircraft and/or crew makes it imperative. 1) Do not take off unless all four engines will achieve takeoff power settings. 2) Do not perform no-flap takeoffs or three-engine takeoffs.
Thrust Reversers **(E)**	4	0	1) Use only symmetrical reverse thrust. Ensure inoperative reverser(s) and its symmetrical counterpart are locked out (pinned) in the forward thrust position. 2) Reverse thrust will not be used if the #1 lever actuation does not cause leading edge flap retraction.
Thrust Reverser Lights **(E)**	4	0	1) May be inoperative and reverser lever used provided reverser is closed in the forward thrust position prior to takeoff. Ensure inspection is accomplished after each landing in which reverser is used. 2) Use only symmetrical reverse thrust. Ensure #1 lever actuation causes leading edge flap retraction.
Engine Ignition	8	4	One per engine.
EPR Gauges **(E)**	4	4	
N1 Gauges **(R)**	4	4	
Tachometer (N2)	4	4	1) One may be inoperative after engine start provided all other indicators for affected engine are operating normally. 2) **(E)** With one N2 inop: a). Reduced thrust procedures will be used b). Takeoff EPR will not exceed charted TRT minus 0.10.
EGT Gauge	4	4	
Engine Fuel Flowmeter	4	3	One may be inoperative provided all other indicators for affected engine are operating.
Oil Pressure Gauges	4	4	

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Engine Low Oil Pressure Warning Lights	4	4	
Engine Oil Filter Warning Lights **(E)**	4	4	
Oil Temperature Indicators	1	1	
Engine Fire Detector System (**E**)	1	1	
Engine Fire/Overheat Detection & Extinguishing System (**R**)	1	1	
PMC **(R)**	4	3	1) Refer to Aircraft Flight Manual, Section 1. 2) Simulated 3-engine approaches and touch and go landings are not authorized with PMC inop.
APU **(R)**	2	0	Ensure engine start capability exists at recovery site.
APU **(E)**	1	0	

Table 4.2. Hydraulics.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Hydraulic Systems	2	2	Must have appropriate accumulator preload.
Auxiliary Pumps	2	1	Left auxiliary pump must operate.
Hydraulic Pumps	4	4	
Hydraulic Systems Pressure Gauge	9* (10 ART)**		Sufficient operable gauges to monitor all systems hydraulic pressures inflight. * 4 Pilot Station, 3 Wheel Well & 2 Boom Pod **1 Added gauge on air refuelable tankers (ART)
Hydraulic Quantity Gauge	1	1	
Copilot Instrument Power Hydraulic Motor	1	1	
Hydraulic Pump Inop Caution Lights	4	4	

Table 4.3. Flight Controls.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Warning Horn and Cutout Switch	1	1	
Stabilizer Trim Control Switches	2	1	The trim switch must operate for the pilot flying during critical phases of flight.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Electric Trim Motor	1	1	Autopilot pitch trim motor does not satisfyrequirement.
Power Rudder System	1	1	
Flap Position Indicators	4	3	One may be inoperative on either flap gauge provided: a) Flaps operate normally. b) Verify flap position before each takeoff and landing.
Spoiler Systems	2	2	
Yaw Damper **(E)**	1	0	Must operate for long range cruise above FL 250.
Yaw Damper Disengaged Light **(E)**	1	0	
EFAS **(R)**	1	1	
SYD **(R)**	1	1	

Table 4.4. Landing Gear and Brakes.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Landing Gear Position Indicators	3	3	
Landing Gear Lock Alignment Stripes	3	3	
Wheel Brakes	8	8	
Anti-skid System	1	1	
Parking Brake	1	1	
Landing Gear Handle Warning Light	1	1	

Table 4.5. Air Conditioning, Pressurization, and Bleed Air System.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Cabin Pressure Control	1	1	1) Automatic or manual mode must be operable. 2) **Exception**: Not required for unpressurized flight, see AFI 11-202, Volume 3 for requirements. Waiver Required.
Air Conditioning Temperature Control	1	1	Automatic or manual mode must be operable.
Bleed Valves **(R)**	4	3	Must have repair capability at next destination.
Bleed Valves **(E)**	4	3	Must fail to the closed position. Consider pressurization and temperature for sustained high altitude cruise.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Bleed Air (Air Conditioning) Crossover Valve	1	1	
Cabin Altitude Gauge	1	1	
Cabin Pressure Warning Light	1	0	
Bleed Air System Caution Lights **(R)**	12	12	Leak detect lights must illuminate when the bleed air press-to-test switch is depressed.

Table 4.6. Autopilot.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Autopilot	1	0	Comply with FLIP requirement for INS-coupled course guidance. See chapter 3, paragraph **3.9.**, of this AFI for FDP limits. For PC, see **Table 4.23.**
Disengage Button	2	0	For autopilot on air refueling, pilot flying must have an operable disengage button.

Table 4.7. Fuel Systems (Nonstandard fuel loads--WAIVER REQUIRED) (For MPRS, see Table 4.24.).

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Tank to Engine Manifold Valves	4	3	Must fail to open position. Pull circuit breaker.
Center Wing to Fwd Body Tank (Drain) Valves	2	0 * 1 **	* CWT Quantity 0. ** Failed to closed position only.
Air Refueling Manifold to Engine Manifold Valve	1	1	
Reserve Tank (Drain) Valves	2	0	If fuel is not needed for flight, and valves are verified closed.
Upper Deck (Drain) Valve	1	0	Must be able to manually open valve if needed.
Wing to Aft Body Tank Valves	4	4	
Air Refueling Line Valve	1	0	When electric function has failed the line valve must be manually opened for all takeoffs regardless of gross weight.
Boost Pumps	8	8	
Override Pumps	2	2	1) Zero required if center wing fuel is not necessary for mission accomplishment. 2) With 1 or both pumps inoperative, consider center wing fuel unusable for planning purposes.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Air Refueling Pumps	4	3	1) All must operate for extended over-water operations. 2) All must operate for gross weights which do not permit an immediate landing under normal flight manual landing parameters.
Air Refueling Pump Automatic Shutoff System	1	0	Comply with Flight Manual Procedures.
Engine Manifold Fuel Low Pressure Warning Light	1	1	
Fuel Low Pressure Warning Lights	4	0	
Fuel Dump System	1	1	
Fuel Temperature Gauge **(R)**	1	0	
IFMP	1	1	
Total Fuel Quantity	1	0	Compute total fuel manually.
CG Indicator (w/ TCTO 1131)	1	0	Compute CG manually.
Fuel Transfer Quantity Display (w/ TCTO 1131)	1	0	
Fuel Transfer Rate Display (w/ TCTO 1131)	1	0	
Fuel Gauges/Displays	**Installed**	**Required**	**Remarks/Limitations/Exceptions**
Main Tanks	4	4	
Center Wing Tank	1	1	
Reserve Tank	2	0	1) Visually confirm fuel quantity prior to take off. 2) Without TCTO 1131, open the associated 115-volt AC fuel quantity indicator circuit breaker. 3) With TCTO 1131, must check and comply with ICDU Malfunction/Action messages.
Forward Body Tank	1	1	
Aft Body Tank	1	1	
Upper Deck Tank	1	0	1) Verify tank quantity. 2) With TCTO 1131, must check and comply with ICDU Malfunction/Action messages.
Offload Fuel Flow Rate & Totalizer Gauge (w/o TCTO 1131)	1	0	

Table 4.8. Navigation Systems.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Magnetic Compass	1	0	Mandatory for all passenger/troop carrying flights.
N-1 Compass	1	1	N/A PC.
J-4 Compass	1	1	N/A PC.
INS	1 2-ARP	0*	* With NSO, 1 required for CONUS, 2 required for over-water. For PC, see **Table 4.22.** Mandatory for all passenger/troop carrying flights. 1) Comply with FLIP over-water navigation requirements. 2) Comply with T.O. windshear procedures.
DNS	1	0	Comply with flight manual windshear procedures. N/A PC. Mandatory for all passenger/troop carrying flights.
RMI	3	0	N/A PC. One mandatory for all passenger/troop carrying flights.
HSI	2	1	Both Pilot's RMIs must operate. N/A PC.
VOR	2	0	As required for navigation or approach. One mandatory for all passenger/troop carrying flights. For PC, see **Table 4.23.**
ILS	2	0	As required for approach. One mandatory for all passenger/troop carrying flights. For PC, see **Table 4.23.**
TACAN	1	0	As required for navigation, approach, formation, or rendezvous. Mandatory for all passenger/troop carrying flights. For PC, see **Table 4.23.**
APN-59 Radar	1	0*	Required if thunderstorms or hazardous conditions that can be detected by airborne radar are forecast or exist along route of flight. N/A PC. * Required for ART in receiver role
Repeater Scope	1	0	N/A PC.
IFF/SIF	1	0	Comply with ATC and mission requirements. For PC, see **Table 4.23.**
APN 69 / APN 134 Beacon	1	0	
APN 218 Doppler/GSDI	1	0	Must operate if INS inop. For PC, see **Table 4.23.**
ASQ 15 Radar Pressure	1	0	Required if APN 59 radar is required for flight.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Electronic Cabinet Cooling	1	1	For PC, see **Table 4.23.**
Electronic Cabinet Cooling Overheat Light	1	0	Verify fan operation. For PC, see **Table 4.23.**
Sextant	1	0	As required for over-water navigation.
INS CDU WARN Light	1 2-ARP	1*	*1 required for monitor functioning INS's. For NSO, 2 required for overwater navigation. N/A PC.
DNS CDU WARN Light	1	0	N/A PC.

Table 4.9. Flight Instruments.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Mach Indicators	2	1	One may be inoperative with no associated pitot static problems. N/A PC.
Indicated Airspeed Indicators	2	2	
True Airspeed Indicator	1	0	May be inoperative with no associated pitot static problems.
Vertical Velocity Indicators	2	1	N/A PC.
Barometric Altimeters	3	2	Navigator's altimeter may be inoperative with no associated pitot static problems.
Radio Altimeters	2	1	
Outside Air Temperature Gauge	2	1	
Accelerometer	1	0	
Flight Director / Rotation Go-Around System (FD/RGA)	2	1	
Angle of Attack (AOA)	2	1	
Comparator Warning System	1	0	
Pitot Static Heat	1	1	
ADI	2	2	N/A PC.

Table 4.10. Oxygen Systems.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Oxygen System	2	1	Primary system must be operable, minimum pressure 325 psi.
MA-1 Portable Oxygen Bottles	8	*	* One per primary crewmember.
Oxygen Regulators	9	*	* Each primary crewmember must have access to an operable regulator during flight.

Table 4.11. Ice And Rain Protection.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Engine Anti-Ice **(R)**	4	4	One anti-ice valve can be manually locked half open if maintenance is not available. Observe Flight Manual procedures, Section 1.
Engine Anti-Ice **(E)**	1	0	All anti-ice valves must operate for flight into known or forecast icing conditions.
Engine Anti-Ice Light **(E)**	1	0	
Windshield Wiper System	1	0	At least one wiper must be operational for flights into forecast precipitation at arrival or departure base.
Window Anti-Ice System (Window Heat)	2	2	Pilot and Copilot #1 and #2 windows must operate.
Boom Operator Heated Window	1	0	Required for Air Refueling Mission
Q Inlet Heat	1	1	
Angle of Attack Transmitter Anti-Ice	2	1	Operative AOA must have anti-ice transmitter.

Table 4.12. Electrical System.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
AC Generator System **(E)**	3	2	1) All must be operative except to avoid delays from airfields where maintenance is not adequate. See Flight Manual "Takeoff with Generator Drive Disconnected" Sec. 1. 2) One time takeoff and flight is permitted with a disconnected generator drive.
Bus Tie Breaker Light **(E)**	3	3	
Generator Breaker Circuit Open Light **(E)**	3	3	
Generator Failure Light **(E)**	3	3	
Generator Drive Oil Temperature Rise Gauge **(E)**	3	3	
Generator Drive Low Oil Pressure Warning Light **(E)**	3	3	
Generator Auto Parallel **(E)**	1	0	See Flight Manual, Sec. 1, Gen. Manual Paralleling.
Generator Power Meter KW / KVAR **(E)**	3	3	
KWS-KVARS Watt-Var Meter Selector Switch **(E)**	1	1	

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Synchronizing Lights **(E)**	2	2	
Battery Charging Ammeter **(E)**	1	1	
Transformer Rectifiers **(E)**	3	3	
DC Load Meter **(E)**	1	1	
DC Power Selector Ammeter Voltmeter Switch **(E)**	1	1	
Selector Paralleling Voltmeter Freq Meter & Synchronizing Light Switch **(E)**	1	1	
Battery (Aircraft/APU) **(E)**	2	1	
AC Generator System **(R)**	3	2	1) All must be operative except to avoid delays from airfields where maintenance is not available. A one time takeoff and flight is permitted with IDG disconnected. 2) The two remaining operational generators must be paralleled and supply power to all three generator buses. The disconnected IDG will be repaired prior to the next flight.
Bus Tie Breaker Circuit Open Light **(R)**	3	3	
Generator Control Breaker Circuit Open Caution Light **(R)**	3	3	
IDG Failure Caution Light **(R)**	3	3	
IDG Disconnect Light **(R)**	3	3	
Generator Control Unit **(R)**	3	3	
Battery Load meter **(R)**	1	1	
Transformer Rectifiers **(R)**	4	3	One battery charging TR may be inoperative.
Battery (Aircraft / APU) **(R)**	2	1	Associated battery charging TR must operate.
DC Ammeter & Voltmeter Selector **(R)**	1	1	
Voltmeter & Freq Meter Selector (AC Meter Selector) **(R)**	1	1	
AC Volt Meter	1	1	
DC Volt Meter	1	1	
Frequency Meter	1	1	

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Switched DC Bus	1	1	Bus must be powered with battery power switch in both normal and emergency positions.
AC Generator Buses	3	3	
Copilot Instrument Power	1	1	See Table 4A1.3. Must be able to operate hydraulically (NORMAL) and electrically (EMERGENCY).
AC Ammeter **(R)**	3	3	

Table 4.13. Communication.

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Interphone System	1	1	1) All primary crewmembers must be able to transmit and receive on interphone. 2) System must be operable at pilot and copilot positions for all missions and boom refueling position for air refueling missions. 3) CALL function must be operable.
UHF Radios	2	1	COMM 1 must operate.
VHF Radio	1	0	As mission requirements dictate.
HF Radio	1	0	As mission requirements dictate.

Table 4.14. Air Refueling Equipment (only required for A/R missions) (For MPRS, see Table 4.25. – Table 4.29.).

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Boom Sighting Door	1	1	Door must operate.
Boom Azimuth Indicator	1	1	
Boom Telescoping Indicator	1	1	
Boom Elevation Indicator	1	1	
Boom Signal Coil	1	1	Not required for drogue A/R. See exceptions in **Chapter 17**, paragraph 13, of this AFI.
Boom Signal Amplifier	1	0	In TMO the tanker must have disconnect capability.
A/R Flood Light	1	0	Comply with A/R manual requirements.
A/R Nozzle Light	1	0	Comply with A/R manual requirements.

Table 4.15. Miscellaneous Equipment (For MPRS, see Table 4.30. and Table 4.31.).

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Position lights (Wing Tips and Tail)	4	3	Both wing tip lights and one tail light must be operative.
Strobe Lights	2	1	

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Landing Lights	3	1	Consider night visibility limitations.
Taxi Lights	2	0	One taxi or terrain light must be operative for night operations.
Terrain Light	1	0	
Emergency Alarm Bell System	1	1	Every person on the aircraft must be able to hear the warning system from their seat.
Fire Fighter's Equipment Containers	2	2	
Fire Extinguishers	3	2	One on flightdeck and one at aft hatch.
Escape Ropes	4	4	
Door Warning Light	1	0	Crew entry door and cargo door must be visually verified secured.
Overhead Panel Caution Light **(R)**	1	0	

Table 4.16. Control Display Units (CDUs).

Item/System/CBIT Code	Installed		Required		Remarks/Limitations/Exceptions
	3P	4P	3P	4P	
CDU-900B	2	3	2	2	Pilot's and copilot's must be operational. Navigator's should be operational when flying a four person crew. **Airborne**: Continue at crew's discretion.

CBIT Codes/Title	Remarks/ Limitations
01 - Subsystem Statu	CDU inoperative.
02 - Terminal Status	CDU inoperative.
03 - Expansion I/O Status 3	CDU inoperative.
04 - Expansion I/O Status 2	CDU inoperative.
05 - Expansion I/O Status 1	CDU inoperative.
06 - Display Status	CDU inoperative.
07 - 1553 CD Status	CDU operative, however, FMAC/FSAS information unavailable on CDU.
08 - 1553 AB Status	CDU inoperative on the ground. **Airborne:** Continue at crew's discretion.
09 - Serial Status	CDU inoperative.
10 - Discretes Status	CDU inoperative.
11 - Power Supply Status	CDU inoperative.
12 - Flash Memory Status	CDU inoperative.
13 - NVM Status	CDU inoperative.
14 - ROM Status	CDU inoperative.
15 - RAM Status	CDU inoperative.

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
16 - CPU Status	CDU inoperative.		

Table 4.17. Multi-Functional Display Units (MFDs).

Item/System/CBIT Code	Installed		Required		Remarks/Limitations/Exceptions
	3P	4P	3P	4P	
MFD	5	6	3	4	The center MFD and one of the pilot's front MFDs can be inoperative, provided PFD mode can be displayed on the remaining pilot's front MFD. **MFD 2B must be operational for all flights. Four person operation:** The navigator's MFD must be operational. **Airborne:** Mission may be continued with one operational MFD at each pilot's station. Both MFDs must be operable in the PFD mode. Radar will not be available in this case and mission completion is at the crew's discretion.
MFD Control Panel	2	3	2	2	Both pilot's MFD CPs must be operational. **Four person operation:** The navigator's and at least one pilot's MFD CP must be operational. The operational MFD CP must be associated with an operational radar control panel. **Airborne:** The MFD will go to the default mode and radar will not be available at the failed station. If both pilot's MFD CPs fail suitable navigation information will be available in the default mode. The mission can be continued at the crew's discretion.

CBIT Codes/Title	Remarks/ Limitations
01 – CPU Fail	MFD inoperative.
02 – RAM Memory Fail	MFD inoperative.
03 – EPROM Fail	MFD inoperative.
04 – EEPROM Fail	MFD inoperative.
05 – WXR Fail	MFD operative. Radar data unavailable on MFD.
06 – Graphic Fail	MFD inoperative.
07 – LCD Driver Fail	MFD inoperative.
08 – Lamp Fail	MFD inoperative.
09 – 26 VAC Ref Fail	MFD inoperative.
10 – Synchro Fail	MFD inoperative.
11 – A/D Converter Fail	MFD inoperative.

Item/System/CBIT Code	Installed		Required		Remarks/Limitations/Exceptions
	3P	4P	3P	4P	
12 – AC Out Fail	MFD operative, however, autopilot and flight director NAV-LOC will be inoperative.				
13 – DC Out Fail	MFD inoperative.				
14 – Discrete Out Fail	MFD inoperative.				
15 – Control Panel Fail	MFD CP inoperative.				
16 – Parity Fail	MFD inoperative.				

Table 4.18. Color Weather Radar (WXR).

Item/System/CBIT Code	Installed		Required		Remarks/Limitations/Exceptions
	3P	4P	3P	4P	
WXR-700X Radar	1	1	0	0	Required if thunderstorms or IMC conditions are forecast along route of flight.
WCP-701 Radar Control Panel (RCP)	2	3	0	0	One panel must be operational if radar is required to complete the mission.
Predictive Wind Shear -PWS	1	1	0	0	Required if thunderstorms or IMC conditions are forecast along route of flight.
CBIT Codes/Title	**Remarks/ Limitations**				
01 – R/T Fail	Radar RT inoperative.				
02 – Antenna Fail	Radar RT inoperative.				
03 – On-side Attitude Fail	Stab switch inoperative; Radar RT inoperative for 3P.				
04 – Control 0 Invalid	Pilot's radar controls inoperative (MFD).				
05 – Control 1 Invalid	Copilot's radar controls inoperative (MFD).				
06 – Control 2 Invalid	Navigator's radar controls inoperative (MFD).				
07 – Control 3 Invalid	Pilot's RCP inoperative.				
08 – Control 4 Invalid	Copilot's RCP inoperative.				
09 – Control 5 Invalid	Navigator's RCP inoperative.				
10 – Heading Fail	Radar RT inoperative on ground. **Airborne:** Continue at crew's discretion.				
11 – Altitude Input Fail	PWS inoperative.				
12 – Air Data Fail	PWS inoperative.				
13 thru 16 – Unused					

Table 4.19. Bus Subsystem Interface Unit (BSIU).

Item/System/CBIT Code	Installed		Required		Remarks/Limitations/Exceptions
	3P	4P	3P	4P	
BSIU	1	1	1	1	
CBIT Codes/Title	**Remarks/ Limitations**				
01 thru 03 – Unused	BSIU inoperative.				
04 – Flash Memory	BSIU inoperative.				
05 – Subsystem Fail	BSIU inoperative.				

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
06 – Terminal Fail	BSIU inoperative.		
07 – CPU SRU	BSIU inoperative.		
08 – Memory SRU	BSIU inoperative.		
09 – 1553 #2 SRU	BSIU inoperative on ground. **Airborne:** Continue at crew's discretion.		
10 – 1553 #1 SRU	BSIU inoperative on ground. **Airborne:** Continue at crew's discretion.		
11 – Power Supply	BSIU inoperative.		
12 – SIM 5 - J10 (ADI)	BSIU inoperative.		
13 – SIM 4 - J9 (IFF)	BSIU operative and IFF will not be impacted due to new hardware configuration.		
14 thru 16 – Reserved			

Table 4.20. Data Loader (DLDR).

Item/System/CBIT Code	Installed		Required		Remarks/Limitations/Exceptions
	3P	4P	3P	4P	
Data Loader	1	1	1	0	
CBIT Codes/Title	**Remarks/ Limitations**				
01 thru 03 – ReservEd	DLDR inoperative.				
04 – Terminal Address, Illegal Parity Used	DLDR inoperative.				
05 – Fail-Safe Timer Fail	DLDR inoperative.				
06 – Checksum	DLDR inoperative.				
07 – Reserved					
08 – RAM Fault	DLDR inoperative.				
09 – Reserved					
10 – LSI Fault	DLDR inoperative.				
11 – Xmtr B Bus	DLDR inoperative on ground. **Airborne:** Continue at crew's discretion.				
12 – Xmtr A Bus	DLDR inoperative on ground. **Airborne:** Continue at crew's discretion.				
13 – Fault B Bus	DLDR inoperative on ground. **Airborne:** Continue at crew's discretion.				
14 – Fault A Bus	DLDR inoperative on ground. **Airborne:** Continue at crew's discretion.				
15 – Subsystem Fail	DLDR inoperative.				
16 – Terminal Fail	DLDR inoperative.				

Table 4.21. Digital Air Data Computer (DADC).

Item/System/CBIT Code	Installed		Required		Remarks/Limitations/Exceptions
	3P	4P	3P	4P	
Air Data Computer	1	1	1	1	
Air Data Computer (With RVSM)	2	2	2*	2*	* Only 1 required for operational missions, unless airspace requirements dictate otherwise.

CBIT Codes/Title	Remarks/ Limitations
01 thru 03 – Unused	DADC inoperative.
04 – ADC Fail	DADC inoperative.
05 thru 14 – Unused	
15 – Subsystem Status	DADC inoperative.
16 – Terminal Status	DADC inoperative.

Table 4.22. Embedded GPS/INS (EGI) & C-IVE INU2.

Item/System/CBIT Code	Installed		Required		Remarks/Limitations/Exceptions
	3P	4P	3P	4P	
INU-1 (EGI)	1	1	1	1	
GPS	1	1	0	0	Initial position and date/time must be manually inserted into the EGI. This will degrade the FMS system accuracy.
INU-2 (Carousel IV)	1	1	1	1	

Table 4.23. Miscellaneous Pacer CRAG and Associated Equipment.

Item/System/CBIT Code	Installed		Required		Remarks/Limitations/Exceptions
	3P	4P	3P	4P	
IFF/SIF	1	1	0	0	Comply with ATC and mission requirements.
Vertical Gyro (SBU-23)	1	1	1	1	Backup attitude for copilot's INU-2 attitude source.
Standby ADI	1	1	1	1	
Synchro Repeaters	4	4	4	4	
1553 Data Bus	2	2	2	2	The bus has 2 channels (A & B).
TCAS	1	1	1*	1*	*Not required for single ship missions. Also required when carrying passengers. **Airborne:** Continue at crew's discretion.
TCAS VSIs	2	2	1	1	If TCAS is required, TCAS information must be available on one VSI, provided it is also available on the center MFD.
Altitude Alerters	1	1	1*	0	* Not required for operational missions. **Airborne:** Continue at crew's discretion.

Item/System/CBIT Code	Installed		Required		Remarks/Limitations/Exceptions
Autopilot	1	1	1*	0	* Not required for operational missions. Comply with FLIP requirements for INS-coupled course guidance. See Chapter 3, paragraph **3.6.**, for flight duty period (FDP) limits. **Airborne:** Continue at crew's discretion.
APN 218 Doppler/GSDI	1	1	0	0	Unable to airborne align INU-2 if GPS fails.
Electronic Cabinet Cooling	1	1	1	1	
Electronic Cabinet Cooling Overheat Light	2	2	0	0	Verify fan operation.
VOR	2	2	0	0	As required for navigation or approach.
ILS	2	2	0	0	As required for approach.
TACAN	1	1	0	0	As required for navigation, approach, formation, or rendezvous.
Flight Data Recorder (FDR) (If Nav Safety Installed)	1	1	1*	1*	* Only required when carrying passengers. **Airborne:** Continue at crew's discretion.
Cockpit Voice Recorder (CVR) (If Nav Safety Installed)	1	1	1*	1*	* Only required when carrying passengers. **Airborne:** Continue at crew's discretion.
Emergency Locator Transponder (ELT) (If Nav Safety Installed)	1	1	1*	1*	* Only required when carrying passengers. **Airborne:** Continue at crew's discretion.
Enhanced Ground Proximity Warning System (E-GPWS) (When installed)	1	1	1*	0	* Not required for operational missions. **Required (3P or 4P):** When carrying passengers. **Airborne:** Continue at crew's discretion.

Table 4.24. A/R Pod Fuel Systems (Nonstandard fuel loads—WAIVER REQUIRED).

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
Air Refueling Pumps (w/TCTO 628)	4	1 or 2*	*One required for single A/R Pod refueling, two required for double A/R Pod refueling.
Wing Isolation Control Valve	2	1	Must be functional from Pilot's Wing Isolation Valve Control Panel.
PCP Offload Total Display	2	0	IFMP Total Fuel, Forward body, and Aft body tank quantity gauges must be functional. Compute offload manually.
Gravity Drain Manifold	1	1	

Table 4.25. A/R Pod Exterior Lighting.

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
Pod Illumination Lights	2	1	Pod refuel, only, on side with operating PCP.
Outboard Nacelle Illumination Lights	2	1	Pod refuel, only, on side with operating PCP.
Horizontal Stabilizer Illumination Lights	2	1	Pod refuel, only, on side with operating PCP.

Table 4.26. A/R Pod Trailing Components.

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
Paradrogue	2	1	Pod refuel, only, on side with operating PCP.
MA-4 Reception Coupling	2	1	Pod refuel, only, on side with operating PCP.
Buffer Spring Assembly	2	1	Pod refuel, only, on side with operating PCP.
Hose Assembly (Pod Hose)	2	1	Pod refuel, only, on side with operating PCP.

Table 4.27. Boom Operator A/R Pod Receiver Viewing System.

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
A/R Pod Receiver Viewing System (Existing Observation Window—Two per side in Boom Pod)	4	2	Adequate field of vision to conduct A/R Pod refueling, at the discretion of the boom operator.

Table 4.28. Boom Operator Compartment A/R Pod Controls and Indicators.

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
Aerial Refuel Master Switch	1	1	Must be on to provide pod exterior lighting, PCP switch, and emergency breakaway signal switch power.
Emergency Breakaway Switch Signal (On Boom Telescope Lever)	1	1	Must be functional.
Pod Control Panel (Left & Right)	2	1	One side may be inoperative if other side is operative.
Hose Jettison Switch	2	2	Hose must be at full trail to jettison.
Master Power/On Switch	2	1	Pod refuel, only, with operating PCP.
Isolation Valve Switch	2	1	Pod refuel, only, with operating PCP.
Fuel Pressure High Light	2	1	Pod refuel, only, with operating PCP.
Ram Air Turbine Overspeed Light	2	1	Pod refuel, only, with operating PCP.

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
Fuel Temperature High Light	2	1	Pod refuel, only, with operating PCP.
Fuel Pressure Low Light	2	1	Pod refuel, only, with operating PCP.
Pod Failed Light	2	1	Pod refuel, only, with operating PCP.
Full Trail Advisory Light	2	1	Pod refuel, only, with operating PCP.
Pod Refueling Range Advisory Status Lights (Green)	14	7	Pod refuel, only, with operating PCP.
Pod Forward Limit Advisory Status Lights (Amber)	2	1	Pod refuel, only, with operating PCP.
Pod Warning Advisory Status Lights (Red)	2	1	Pod refuel, only, with operating PCP.
Hose Stowed Advisory Light (Blue)	2	1	Pod refuel, only, with operating PCP.
Alarm Override/Volume Switch/Control	1	1	
Pod Valve Switch	2	1	Must be functional on operating PCP for overwater fighter deployments.
Pod Valve Armed/Open Light	2	1	Must be functional on operating PCP.
PCP Lights Dim Switch	1	0	PCP(s) must still be functional. Refuel at crew's discretion.
Panel Lights Test Switch	1	1	
Pod Light Dimming Flood Control	2	1	Refuel at crew's discretion.
BITE Switch	2	1	Must be functional on operating PCP.
Reset Switch	2	0	
Rewind/Trail Switch	2	1	Must be functional on operating PCP.

Table 4.29. A/R Pod Receiver Signal Lights.

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
Red Lights	4	2	Must be functional on operating pod. Refuel, only, on side with operating A/R Pod.
Amber (Yellow) Lights	4	2	Must be functional on operating pod. Refuel, only, on side with operating A/R Pod.
Green Lights	4	2	Must be functional on operating pod. Refuel, only, on side with operating A/R Pod.

Table 4.30. Pilot A/R Pod Controls and Indicators.

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
Drogue Not Stowed Indictor Lights (Left & Right)	2	0	Visually confirm drogue is fully stowed upon completion of A/R Pod refueling.

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
A/R Pod Engaged Indictor Lights (Left & Right)	2	0	Visually confirm when receiver is in the contact or disconnect position. Visually monitor offload by all means available.
Isolation Valve Switches	2	1	Remaining Isolation valve switch must be functional.
Isolation Valve Open/Closed (Position) Indicator Lights (Left & Right)	2	1	Boom Operator's PCP Isolation valve switch must be functional on PCP to be used during A/R Pod refueling.

Table 4.31. A/R Pod/Pylon.

Item/System/CBIT Code	Installed	Required	Remarks/Limitations/Exceptions
Ram Air Turbine	2	1	Must be functional on operating pod.
Fuel Pump	2	1	Must be functional on operating pod.
Fuel Supply Line	2	2	
Hose Drum Assembly	2	1	Must be functional on operating pod.
Drouge	2	1	Must be functional on operating pod.
Power Supply	2	1	Must be functional on operating pod.
Tensator Unit (5 Cassettes on each pod)	10	5	Must be functional on operating pod.
Vane Pump	2	1	Must be functional on operating pod.
Fuel Control Valve (FCV)	2	1	Must be functional on operating pod.
Digital Refueling Control Unit (DRCU)	2	1	Must be functional on operating pod.

Chapter 5

OPERATIONAL PROCEDURES

5.1. Checklists. A checklist is not complete until all items have been accomplished. Momentary hesitations for coordination items, ATC interruptions, and deviations specified in the flight manual, etc., are authorized. Notes amplifying checklist procedures or limitations may be added to the checklists (in pencil).

5.1.1. Checklist Inserts. Units may supplement T.O. guidance (e.g., Secure Communications Checklist, etc.) with HQ AMC/DOV approved checklist inserts. Place inserts at the end of the appropriate checklist or in an in-flight guide. All checklist inserts must have a POC. If any crewmember has recommendations or change requests, they should contact the POC. POC will consolidate inputs and submit changes to the OPR (this directive). Unit OGV may approve local in-flight guides and inserts not affecting T.O. guidance and procedures.

5.2. Duty Station. A qualified pilot will be in control of the aircraft at all times during flight. ***EXCEPTION:*** Unqualified pilots undergoing qualification training or senior staff members who have completed the Senior Staff Course. The AC, copilot, flight engineer, navigator, and boom operator will be at their duty stations during all critical phases of flight. During other phases of flight, crewmembers may leave their duty station to meet physiological needs and to perform normal crew duties, only one pilot may be absent from their duty station at a time. During cruise flight, the boom operator may leave his/her duty station for longer periods with AC approval. When additional aircrew personnel are aboard or the boom operator is not otherwise performing primary crew duties, the IP seat should be occupied to assist the crew in avoiding other aircraft during takeoff, departure, penetration, approaches and landings. Crewmembers will notify the pilot prior to departing assigned primary duty stations.

5.3. Control Cabin Entry. Aircraft Commanders may authorize passengers and observers access to the control cabin during all phases of flight. In all cases, sufficient oxygen sources must be available to meet the requirements of AFI 11-202, Volume 3. Passengers or observers will not be permitted access to the pilot or copilot position regardless of its availability.

5.4. Takeoff and Landing Policy. After thoroughly evaluating all conditions, the AC will determine who accomplishes the takeoff and landing and occupy either the left or the right seat during all takeoffs and landings.

5.4.1. A qualified AC will accomplish all approaches and landings under actual emergency conditions unless specific conditions dictate otherwise.

5.5. Not used.

5.6. Outside Observer. When available, use a crewmember to assist in outside clearing during all taxi operations and any time the aircraft is below 10,000 feet MSL.

5.7. Seat Belts.

5.7.1. Crewmembers occupying pilot, copilot, flight engineer, navigator, or boom operator positions will have seat belts fastened at all times in-flight, unless crew duties dictate otherwise.

5.7.2. All crewmembers will be seated with seat belts and shoulder harnesses fastened during taxi, takeoff, receiver A/R, and landing, unless crew duties dictate otherwise. For A/R, all aircrew members and passengers will be seated with seat belts fastened (unless authorized by the AC to observe tanker A/R or crew duties dictate otherwise). Crewmembers performing instructor or flight examiner duties are exempt from seat belt requirements; however, a seat with an operable seat belt will be assigned.

5.7.3. The AC will direct all occupants to fasten seatbelts securely when turbulence is encountered or expected.

5.8. Aircraft Lighting. External lighting will be in accordance with AFI 11-202, Volume 3 and applicable T.O.s.

5.9. Portable Electronic Devices. Comply with AFI 11-202, Volume 3.

5.9.1. Unauthorized equipment (e.g., Walkman-type radios/tape players, CD players, etc.) will not be connected to the aircraft intercom, PA or radio systems.

5.10. Smoking Restrictions. Smoking is prohibited on board the aircraft.

5.11. Advisory Calls. . In addition to those contained in the Dash 1, the following advisory calls are required over interphone. (PNF designates pilot-not-flying.) For Pacer CRAG, the altitude alerter/E-GPWS does not delete the requirement for advisory calls, except for those that are made by the altitude alerter/E-GPWS. The PF must acknowledge all advisory calls, including those made by the altitude alerter/E-GPWS.

5.11.1. Climbout: Transition altitude (PNF).

5.11.2. Descent: Transition level (PNF).

5.11.3. Deviations: Any crewmember noting an apparent error in aircraft attitude, altitude, heading or airspeed, or any condition which may impact safety of flight, will immediately notify the pilot flying the aircraft.

5.11.4. Pilots will periodically announce their intentions when flying departures, arrivals, approaches, and when circumstances require deviating from normal procedures.

5.12. Communications Policy. The Air Force does not give a promise of confidentiality to aircrews regarding their recorded aircraft crew communications. Crewmembers are expected to maintain a high degree of cockpit professionalism and crew coordination at all times.

5.12.1. Sterile Cockpit. Limit conversation to that essential for crew coordination and mission accomplishment during taxi, takeoff, air refueling, approach, landing, and any flight below 10,000 feet MSL (except cruise).

5.12.2. Aircraft Interphone. Primary crewmembers will monitor interphone except when crew duties or physiological needs dictate otherwise.

5.12.3. Command Radios:

5.12.3.1. The pilot not flying the aircraft normally makes all ATC radio calls.

5.12.3.2. In terminal areas the pilot, copilot, navigator, flight engineer, and boom operator will monitor the primary command radio unless directed otherwise. The designated crewmember should monitor C2 frequencies (if applicable) on the inbound and outbound leg, unless otherwise directed.

5.12.3.3. The pilot operating the command radios will inform the crew when the primary radio is changed.

5.12.3.4. One pilot should record and will acknowledge all ATC clearances. The navigator or boom operator will monitor the readback and will ensure compliance with all clearances.

5.12.3.5. Both pilots will monitor UHF guard (or VHF guard when appropriate) emergency frequency regardless of primary radio.

EXCEPTION: Only one crewmember is required to monitor guard frequency during tanker or receiver rendezvous and A/R. During tanker A/R, the PNF normally monitors guard.

5.12.4. Crew Resource Management (CRM) Assertive Statement “Time Out":

5.12.4.1. "Time Out" is the common assertive statement for use by all crewmembers. The use of "Time Out" will:

5.12.4.1.1. Provide a clear warning sign of a deviation or loss of situation awareness.

5.12.4.1.2. Provide an opportunity to break the error chain before a mishap occurs.

5.12.4.1.3. Notify all crewmembers that if someone sees the aircraft or crew departing from established procedures, the briefed scenario, or that someone is simply uncomfortable with the developing conditions.

5.12.4.2. As soon as possible after a "Time Out" has been called, the aircrew will take the following actions:

5.12.4.2.1. Safety permitting, stabilize the aircraft.

5.12.4.2.2. The initiating crewmember will voice his or her concerns to the crew.

5.12.4.2.3. The aircraft commander will provide all other crewmembers with the opportunity to voice inputs relative to the stated concerns.

5.12.4.2.4. After considering all inputs, the aircraft commander will direct the aircrew to continue the current course of action or direct a new course of action.

NOTE: The aircraft commander is the final decision authority.

5.13. Transportation of Pets. Transporting pets (dogs and cats) on aircraft operated by or under the control of AMC in conjunction with the sponsors permanent change of station is authorized. Other pets or animals are normally prohibited, but may be moved according to DODR 4515.13.

5.14. Alcoholic Beverages. MAJCOM/DO may authorize the dispensing of alcoholic beverages to passengers.

5.15. Runway, Taxiway, and Airfield Requirements. See **Table 5.1.** MAJCOM/DO are waiver authority for runway, taxiway, and airfield requirements. The following are the minimum runway length, width, and taxiway widths for normal operations. *In all cases ensure obstacle clearance requirements are met. Landing distance will not exceed runway available.* Crews will normally use 0.80 delayed braking factor (DBF) for computing landing distance. AC's may direct using up to 0.90 DBF as an exception on a case by case basis, but must be aware of the resultant increase in brake wear. OG/CC or equivalent approval is required for landings planned with greater than 0.90 DBF. When using greater than 0.80 DBF crews will brief the planned braking speed.

Table 5.1. Runway, Taxiway, and Airfield Minimum Length and Width.

	Minimum	**Minimum**	**Minimum**
	Runway Length	**Runway Width**	**Taxiway Width**
C-135	8000 feet	147 feet	75 feet (stressed)
KC-135R/E/T	7000 feet	147 feet	75 feet (stressed)
C-135B	7000 feet	147 feet	75 feet (stressed)

5.15.1. For mission accomplishment, if approach end overruns are available, stressed and authorized for normal operations, they may be used to increase the runway available for takeoff. Departure end overruns (if stressed and authorized) may also be used for landing if needed.

5.15.2. For all AMC missions, aircrews and planning agencies should contact HQ AMC/DOVS (Airfield Analysis Branch) for all questions pertaining to airfield weight bearing capability and will review the ASRR prior to all off-station operations. If necessary, airfield waivers must be obtained before mission execution. Once a mission is executed the AC is responsible for determining airfield suitability based upon operational need. See summary of airfield restrictions for airfield certification requirements.

5.15.3. Runway Length for Takeoff and Intersection Takeoffs. Normally, takeoffs will be initiated from the beginning of the approved usable portion of the runway. The decision to make intersection takeoffs rests solely with the aircraft commander.

5.15.3.1. Intersection takeoffs may be accomplished provided the operating environment (i.e., gross weight, obstructions, climb criteria, weather, etc.) will allow a safe takeoff and departure.

5.15.3.2. When less than the entire runway is used, takeoff and landing data (TOLD) computations will be based on the actual runway remaining from the point at which the takeoff is initiated.

5.15.3.3. During operations on runways partially covered with snow or ice, takeoff computations will be based on the reported RSC or RCR for the cleared portion of the runway. A minimum of 50 feet either side of centerline should be cleared. If 50 feet either side of centerline is not cleared, then compute data based on the uncleared portion up to 50 feet either side of centerline.

5.15.4. Arresting Cables (does not include recessed cables).

5.15.4.1. Do not land on approach end arresting cables. If the aircraft lands before the cable, the crew should contact the tower to have the cable inspected.

5.15.4.2. Do not takeoff or land over an approach end cable that has been reported as slack, loose, or improperly rigged by NOTAM, ATIS, or ATC.

5.15.5. Operation from RAF Fairford and RAF Mildenhall. An RCR 15 may be used for computing takeoff performance for all operational and training missions when wet runway conditions exist. This authorization does not apply to landing data computations or when standing water is on the runway. Determination of standing water versus wet runway conditions will be made by the 100 OG/CC.

5.15.6. Operation from Honolulu International Airport. All C/KC-135 aircraft departing from Honolulu International Airport will comply with locally developed noise abatement procedures. Aircraft will remain west of Aloha Tower, south of Ewa Beach, and at least 1 mile offshore of Waikiki, Diamond Head, Koko Head, and Ewa Beach.

5.15.7. Operation from Kadena AB, Okinawa. The obstacle (twin smokestacks) off the end of Rwy 5 must always be accounted for if taking off from Rwy 5L. It is sufficiently left of the Rwy 5R departure corridor to allow the following policy: KC-135R takeoff data for Rwy 5R at Kadena need not account for the obstacle if a 30-Max, TRT or MCL takeoff is made, and the SID is flown. To ensure additional lateral clearance, aircrews will consider the obstacle location and formulate an escape plan as part of the pre-takeoff normal/emergency considerations recap, whenever this policy is exercised.

5.15.8. Operations from MacDill AFB. Due to ATC restrictions; 1,600 feet above the runway, instead of 2,000 feet as directed by the Dash 1, will be used for flap clean-up height during MAX mode takeoffs or in the event of an engine failure on takeoff. The maximum flap clean-up height for ACCL mode takeoffs will be 1,600 feet.

5.15.9. Essential Refueling Support for Reconnaissance Aircraft. Crews of KC-135 aircraft providing "essential" air refueling support of operational RC-135 reconnaissance missions and operating from runways with grooved or porous surfaces are authorized to use an RCR 15 to compute critical field length, critical engine failure speed and refusal speed when the runway RCR is reported as wet. Other takeoff speeds will be computed using current flight manual procedures and comply with any limitations imposed by supplementing command regulations. Present flight manual procedures for computing takeoff data with a reported RCR, other than "wet runway," or RSC (ice, snow, and slush) are valid and remain unchanged. This special procedure does not apply to landing data computations.

NOTE: Those refuelings considered essential will be identified by either the reconnaissance operating location commander or by the MAJCOM.

5.16. Aircraft Taxi Obstruction Clearance Criteria and Foreign Object Damage (FOD) Avoidance.

5.16.1. Without a marshaller and wing walkers, avoid taxi obstructions by at least 25 feet. With a marshaller and wing walkers, avoid taxi obstructions by at least 10 feet.

EXCEPTION: Per AFI 11-218, aircraft may taxi without marshallers/wing walkers at home station along locally established taxi lines which have been measured to ensure a minimum of 10 feet clearance from any obstruction.

5.16.2. When taxi clearance is doubtful, use one or more wing walkers. If wing walkers are unavailable, deplane one or more crewmembers to maintain obstruction clearance and provide marshalling. Use AFI 11-218, *Aircraft Operation and Movement on the Ground*, signals. The aircraft commander should use marshallers and wing walkers, or deplaned crewmembers to act as observers while maneuvering on taxiways less than 75 feet wide. (Waiver required to operate on taxiways less than 75 feet wide.) During night taxi operations, marshallers will have an illuminated wand in each hand. Wing walkers are only required to have one illuminated wand.

5.16.3. FOD Avoidance. Make every effort to minimize the potential for engine FOD. Crews should:

5.16.3.1. Carefully review airfield layout during mission planning. Be familiar with taxi routes, turn requirements, and areas for potential FOD.

5.16.3.2. Confirm that taxi routes have been swept. If taxi route has not been swept, consider taxiing via an alternate route.

5.16.3.3. Minimize power settings during all taxi operations.

5.16.3.4. Avoid (when possible) taxi operations, which would position engines over an unprepared or unswept surface. If it becomes necessary to position engines over an unprepared or unswept surface, the engines should be shut down or left in idle until they are back over an improved surface. Consider increasing power on inboard engines, if necessary.

5.17. Fuel Requirements. (AFI 11-202, Volume 3) This paragraph implements standard minimum fuel requirements.

5.17.1. Required ramp fuel will consist of all fuel required for engine start, taxi, takeoff, climb, cruise, planned off load, alternate/missed approach (if required), descent, approach, transition, landing, and fuel reserve. Final landing fuel will not be less than 7,000 pounds of useable fuel.

5.17.2. Aircraft filing to the following destinations will have sufficient fuel over the destination fix or radio check-in points to reach the designated alternate with 9,500 pounds usable fuel reserve: United Kingdom, Spain, Goose Bay, Greenland, or Alaska (from October to April).

5.17.3. Minimum fuel reserves for remote or island destination is 15,000 pounds usable fuel. If weather conditions require an alternate airfield in accordance with AFI 11-202, Volume 3, aircrews may use 1+15 hours of holding fuel (in lieu of an alternate). A remote or island destination is defined as any aerodrome which, due to its unique geographic location, offers no suitable alternate (civil or military) within 2 hours flying time.

5.17.4. Authorized Fuel Loads and Sequences. Aircraft will be loaded with fuel according to requirements of the handbook of weight and balance data. The OG/CC or equivalent will issue waiver approval. Units may develop standard alternate fuel requirements for local training missions; however, these fuel requirements will not be less than those specified in this volume.

5.18. Fuel Jettison Procedures. Fuel jettison is limited to the minimum necessary for safe and effective flight operations. Except in the case of an emergency, prior to jettisoning fuel, crews will notify the appropriate ATC or flight service facility of intentions, altitude, and location. Inform the appropriate ATC or flight service facility when the operation is complete.

5.18.1. Jettison fuel only under the following circumstances:

5.18.1.1. Aircraft emergency. Immediate reduction of gross weight is critical to safe recovery of the aircraft.

5.18.1.2. Urgent operational requirements. Immediate reduction of gross weight is necessary to meet urgent operational mission tasking.

5.18.2. Units will establish jettison areas and procedures to minimize the impact of fuel jettisoning into the atmosphere.

5.18.2.1. Units will initiate AF Form 813, **Request for Environmental Impact Analysis**, and submit to the base environmental coordinator.

5.18.2.2. Designate jettison areas off published airways and avoid urban areas, agricultural regions, and water supply sources.

5.18.2.3. Avoid circling descents.

5.18.3. Use jettison altitudes above 20,000-feet AGL to the maximum extent possible.

5.18.4. Use designated jettison areas to the maximum extent possible, except when safety of flight would be compromised.

5.18.5. If jettison is accomplished, record all pertinent data to include flight conditions, altitude, airspeed, air temperature, wind direction and velocity, type and amount of fuel, aircraft type and position at time of jettison, time and duration of jettison activity, and reason jettison was accomplished. Retain this information for 6 months as documentation in the event of claim against the government resulting from the fuel jettison.

5.19. Not Used .

5.20. BASH Programs. BASH programs are centralized unit efforts that provide information cross-feed, hazard identification, and a consolidated course of action. As a minimum, units must implement the following procedures:

5.20.1. Ensure compliance with the following Bird Watch condition restrictions:

5.20.1.1. Bird Watch Condition Low: No operating restrictions.

5.20.1.2. Bird Watch Condition Moderate: Initial takeoffs and final landings allowed only when departure and arrival routes will avoid bird activity. Local IFR/VFR traffic pattern activity is prohibited.

5.20.1.3. Bird Watch Condition Severe: All takeoffs and landings are prohibited. Waiver authority is local OG/CC or equivalent. Parent MAJCOM/DO waiver is required to operate at airfields not controlled by the MAF.

5.20.2. Make every effort to not schedule takeoffs, landings, and low-levels from one hour before to one hour after sunrise and sunset during the phase II period. Also, significant bird hazards will be published in FLIP GP and the IFR Supplement along with the associated airfield operating hour restrictions and avoidance instructions.

5.20.3. All units will have a BASH Reduction Plan in accordance with AFI 91-202. Tenant flying units will work with the host base to create a plan.

5.20.4. When operating at airfields where no BASH program exists, aircraft commanders have the authority to delay takeoffs and arrivals due to bird condition. Coordinate actions through appropriate command and control authority.

5.20.5. Howard AFB, Panama has singularly distinctive BASH considerations. Ensure crews comply with AFPAM 91-212/MAJCOM Supplement.

5.20.6. Enroute. The aircrew should consider bird migratory patterns during the enroute portion of the mission to minimize the potential of an in-flight bird strike. The Bird Avoidance Model (BAM) on

HQ AFSC/SEF www site at (http://www-afsc.saia.af.mil/AFSC/Bash/home.htm) provides the latest BASH information and includes regionalized CONUS bird migration patterns, PFPS software overlay, and the latest news. See AFPAM 91-212, *Bird Aircraft Strike Hazard (BASH) Management Techniques*, for additional information.

5.21. Functional Check Flights (FCF) and Acceptance Check Flights (ACF). FCFs and ACFs will be performed according to T.O. 1-1-300 and applicable MAJCOM instructions. Additional guidance can be found in T.O.s 00-20-6, 1C-135(K)A-6CF-1, and applicable Dash 1.

5.21.1. Terms and Abbreviations.

5.21.1.1. FCF-FCFs are performed after accomplishing inspections or maintenance to assure the aircraft is airworthy and capable of mission accomplishment.

5.21.1.2. ACF-ACFs specify procedures for accepting new production aircraft and to determine compliance with contractual requirements (e.g. C checks).

5.21.2. FCF Restrictions.

5.21.2.1. Conditions requiring an FCF according to T.O. 1C-135(K)A-6CF-1 include (but are not limited to) major retrofit modifications, removal or replacement of moveable flight control surfaces, major repairs that would affect the flying characteristics of the aircraft, adjustment, removal or replacement of major components of the flight control system for which airworthiness cannot be verified by maintenance operational checks, or removal or replacement of any two engines.

5.21.2.2. The OG/CC is responsible for the wing FCF program. The OG/CC may waive a complete FCF and authorize an FCF to check only systems disturbed by maintenance, inspection or modification. Additional guidance should be published in the local chapter of these instructions.

5.21.2.3. Check flight should be conducted within the designated check flight airspace of the base from which the flight was launched except when the flight must be conducted under specific conditions, not compatible with local conditions and area restrictions.

5.21.2.4. The decision to approve a combined FCF and ferry flight is the responsibility of the NAF/DO.

5.21.2.5. The best-qualified instructor will accomplish FCFs or Stan/Eval aircrews, which will be designated FCF qualified to their assigned aircrew position by the OG/CC in a letter.

5.21.2.6. FCFs will normally be conducted in daylight, VMC conditions. However, the OG/CC may authorize a flight under a combination of VFR, IFR, and "VFR on Top" conditions. The flight will begin in VFR conditions. If the aircraft and all systems are operating properly, it may proceed IFR to penetrate cloud cover to VFR on top to continue the altitude phase of the flight.

5.21.2.7. FCF aborts: If a malfunction occurs during an FCF and is not related to the condition generating the FCF, and the original condition operationally checks good, the aircraft may be released for flight.

5.21.2.8. OG/CC and deployed mission commander may authorize temporary waivers to these FCF procedures for aircrew qualification when operationally necessary. Permanent waivers require MAJCOM approval.

5.22. Participation in Aerial Events. (IAW AFI 11-209, *Air Force Participation in Aerial Events*.) Aerial events must be sanctioned and individually approved by the appropriate military authority and dated with the FAA. AFI 11-209 identifies events sanctioned for support and the approving authority for each type of event. In addition, AFI 11-209 stipulates that, units participating in aerial events will ensure aerial activities are coordinated with the FAA through the regional Air Force representative.

5.23. Hand-held GPS. Carry a Hand-held GPS on every mission, including local and off-station training missions (**Exception:** A Hand-held GPS is not required for a local mission without passengers or for aircraft equipped with on-board GPS). The Hand-held GPS, when operating properly, can provide useful information; however, it must never be used as the primary navigation source. Use of any Hand-held GPS receiver that has not been EMI certified is restricted to operations above 10,000 ft AGL only. (Note: MAJCOMs maintain a list of HH GPSs' certified for operations below 10,000 feet AGL). Any type of Hand-held GPS may be used above 10,000 feet unless interference is noted with any aircraft system. The actual use of the Hand-held GPS rests with the aircraft commander. Its usage must never jeopardize safety. When aircrews deploy, each crew (including stage crews) will deploy with a Hand-held GPS. This includes KLX-100s, PLGRs, Garmins or Magellans.

5.23.1. Before using the hand-held GPS in flight, aircrew members must receive training and aircraft must be capable of supporting the hand-held GPS equipment.

5.23.2. The hand-held GPS will not be used to update navigation equipment (INS/DNS) unless the hand-held GPS position can be confirmed by another aircraft source (i.e. radar, TACAN, VOR, another INS, or navigator).

WARNING: Electrical problems have been reported on KLX-100 units. It is extremely important to insert all of the batteries in the proper orientation as shown in section 1.1.2, Figures 1-11 through 1-17 of the Operators Guide. The manufacturer confirms that if only one battery is inserted incorrectly, the unit will operate for 10-30 minutes. An increase in temperature may be noted followed by a crackling sound as the battery expands and ruptures. Be extremely careful as battery acid may leak from the bottom of the unit. A way to double-check proper insertion is to go to the GPS Setup page and check the bar graph showing battery power. Make sure it reflects battery strength near 100%. If a problem is detected, shut down the GPS immediately and disconnect unit from any external power source. Report the incident through proper channels. Do not attempt to remove the batteries. This action could cause injury to the individual and will impair investigation for warranty claims.

5.23.3. The AN/PSN-11 (PLGR) GPS Checklist will be used any time the PLGR GPS is used on board the aircraft. When used, aircrew members will place this checklist at the end of their appropriate checklist. Units are authorized to copy this checklist for aircrew use.

5.24. Traffic Advisory and Collision Avoidance System (TCAS). Operate the TCAS with sensitivity set to Traffic Advisory/Resolution Advisory (TA/RA) at all times, except for cell formation. ATC procedures and the "see and avoid concept" will continue to be the primary means of ensuring aircraft separation. However, if visual separation with the intruding traffic can not be assured, it is imperative to follow resolution advisories (RA) to obtain aircraft separation computed by TCAS. Failure to follow the computed RA may increase the probability of a midair collision. Do not exceed aircraft structural limits or safe flight speed in order to follow the RA. Always attempt to visually clear the airspace before maneuvering your airplane in response to a TCAS advisory. Advise ATC as soon as practical when a deviation becomes necessary due to a TCAS resolution advisory.

5.25. Enhanced Ground Proximity Warning System (E-GPWS). When operating in the low altitude structure, it is imperative to follow E-GPWS advisories. Advise ATC as soon as practical when deviation from an ATC clearance is directed by E-GPWS.

NOTE: When the receiver descends and accelerates on air refueling heading, an E-GPWS advisory may be generated as that aircraft passes beneath the tanker. Crews need not comply with such advisories.

5.26. Aircraft Recovery from Unprepared Surfaces. Aircrews will normally not attempt to recover an aircraft after inadvertent entry onto unprepared surfaces not suitable for taxi. Using the appropriate equipment, ground crews will accomplish aircraft recovery. Unless an emergency situation dictates otherwise, aircrews may accomplish recovery only if there is no aircraft damage, the surface will support the aircraft, and the AC has coordinated with appropriate MAJCOM headquarters maintenance authorities.

Chapter 6

AIRCREW PROCEDURES

Section 6A—Pre-mission

6.1. Aircrew Uniform.

6.1.1. Wear the aircrew uniform, as outlined in AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*, and the appropriate MAJCOM supplement on all missions, unless otherwise authorized. When the Foreign Clearance Guide (FCG) requires civilian attire, wear conservatively styled civilian clothing.

6.1.2. Each operations group commander will determine clothing and equipment to be worn or carried aboard all flights commensurate with mission, climate, and terrain involved.

6.1.2.1. All crewmembers will have Nomex gloves in their possession.

6.1.2.2. Wearing Nomex gloves is recommended for all primary crewmembers during engine start, takeoff, and landing.

6.1.2.3. Crewmembers will remove rings and scarves prior to performing aircrew duties in or around the aircraft.

6.1.3. Personnel will have the appropriate items of clothing in their possession when flying in Arctic and Antarctic regions. ***EXCEPTION:*** Not applicable to transoceanic flights or when staging or transiting Elmendorf AFB AK.

6.1.4. See AFI 10-403, *Deployment Planning*, for mobility requirements.

6.2. Personal Requirements.

6.2.1. Passport. Carry a valid passport on all missions outside the 48 conterminous states (PACAF and USAFE will follow MAJCOM guidance). ***Exception***: Unit commanders may authorize newly assigned personnel who have applied for, but not yet received, a passport to act as crewmembers on missions not scheduled to transit locations where passports are required.

6.2.2. Shot Record. Ensure immunization requirements are met. Carry shot record on all missions outside the 48 conterminous states (PACAF and USAFE will follow MAJCOM guidance). Crewmembers must maintain worldwide shot requirements.

6.2.3. Corrective Lenses. IAW AFI 11-202, Volume 3.

6.2.4. Driver's License. A valid driver's license is required on each TDY where use of US government general-purpose vehicles may be required. Contact the local airfield manager if vehicle will be operated on the flight line.

6.2.5. Identification (ID) Tags. Two ID tags are required to be worn or carried on all flights.

6.2.6. FOD Hazards. Crewmembers will not wear wigs, hairpieces, rings, ornaments, pins, clips, other hair fasteners, or earrings in the aircraft or on the flight line.

EXCEPTION: Crewmembers may wear plain elastic hair fasteners and/or barrettes. These fasteners must not interfere with the wearing of headsets or the donning of oxygen equipment and will be accounted for before and after flight.

6.2.7. Carry a helmet with oxygen mask on all flights when sweep-on oxygen masks are not installed at the appropriate crew position and when operational requirements exist.

6.2.8. A reflective belt or suitable substitute will be worn on unlit flight lines during hours of darkness or periods of reduced visibility (IAW AFOSH Standard 127-100, *Aircraft Flight Line - Ground Operations and Activities*).

6.3. Pre-mission Actions.

6.3.1. Accomplish Theater Indoctrination Training prior to transiting the following areas: (1) Asia, Pacific, Australia, and Indian Ocean, (2) Africa and the Middle East, (3) Europe, Baltics, and Russia, (4) Caribbean, Central America, and South America.

6.3.1.1. Contents of the theater indoctrination folders should be tailored to the units' specific mission. As a minimum, the following will be included:

6.3.1.1.1. Mission/Deployment Checklist. A locally developed checklist that includes mobility, training, and personnel requirements that should be accomplished prior to departure and personal/professional items the aircrew must take with them.

6.3.1.1.2. Airspace/Airfield Review. FLIP, FIR/UIR/ADIZ procedures.

6.3.1.1.3. Airspace classifications, ASRR, and airport qualification videos (if available).

6.3.1.1.4. Theater Instrument Procedures. Required instruments and/or procedures for Non-DoD Approaches, course reversal approaches, circling, holding, NDB approaches, Host Nation/Jeppesen Approaches, and Altimeter setting procedures.

6.3.1.1.5. Organized Track Systems. Minimum Navigation Performance Specifications (MNPS) Airspace requirements; North Atlantic and Pacific Region Track Systems.

6.3.1.1.6. Communication and Emergency Procedures. Command and Control, Over-water position reporting, lost communications procedures, emergency procedures, and weather information sources.

6.3.1.1.7. Border Clearance. Foreign Clearance Guide, Customs, Immigration, Agriculture, Insect and Pest Control, and Diplomatic Clearances.

6.3.1.1.8. Flight planning. DD Form 1801 **DoD International Flight Plan**, Jeppesen Computer Flight Plan, Jeppesen Approach Plates and Charts, Theater Weather Conditions, Fuel Reserves and Alternate Requirements, Equal Time Points/Critical Wind Factors, and International NOTAMs.

6.3.1.1.9. Special Military Operations. Altitude Reservations, Due Regard, and Formation/A/R Limitations.

6.3.1.1.10. Other Regulatory Requirements. General navigation procedures, Life Support equipment, hazardous cargo, crew rest/crew duty time, aircraft records/781 procedures, passenger handling, etc.

6.3.1.1.11. Location Information. Command and control/reporting procedures, maintenance problems, aircraft security, social customs and taboos, billeting, transportation, etc.

6.3.1.2. Units may consolidate information common to all geographic areas into one folder titled "general deployment information." The remainder of the folders would contain only theater specific information.

6.3.1.3. Aircrews will review theater indoctrination folders prior to mission/deployment. This review will be tracked in AFORMS as event G290.

6.3.1.4. Upon return, the AC will compile a trip report, when necessary, detailing lessons learned. The trip report will be placed in the theater indoctrination folder, closing the loop on ensuring validity of the folder.

6.3.2. Review tasking, itinerary, and ALTRV requirements.

6.3.3. Review applicable OPORD, FLIP, tactics and SPINS.

6.3.4. Review the FCG for areas of operation. Obtain necessary diplomatic clearances where required.

6.3.5. Obtain required customs forms.

6.3.6. Complete TDY order request forms (if required).

6.3.7. Obtain computerized flight plans (CFP), as appropriate.

6.3.8. Coordinate with combat crew communications for worldwide FLIPs and sufficient communications security (COMSEC) materials for the duration of the mission.

6.3.9. Review anti-hijacking procedures (AFI 13-207, *Preventing and Resisting Piracy [Hijacking]*, and **Chapter 7** of this AFI).

6.3.10. Ensure physiological training, annual physical, immunizations, and standardization checks will remain current throughout the TDY period.

6.3.11. Obtain visas, if required.

6.3.12. Obtain terrain charts for unfamiliar destinations, if available.

6.3.13. Compile sufficient spare forms, flight orders, etc. to cover the TDY period.

6.3.14. Release available seats to passenger terminal or ATOC.

6.4. Aircrew Publications Requirements. Primary crewmembers will carry the publications specified in **Figure 6.1.** on all missions. ***EXCEPTION:*** Receiver A/R manuals carried only by those individuals qualified, and Pacer CRAG publications (identified by PC) carried only by those individuals flying aircraft with TCTO 1433.

Figure 6.1. Publication Requirements.

Publication/Nomenclature	AC	CP	Nav	BO	FE
TO 1C-135(*)*-1, Flight Manual[2]		X[1]			X
-1CL-1, Pilot Checklist[2]	X	X			

Publication/Nomenclature	AC	CP	Nav	BO	FE
-1CL-2, Nav-FE Checklist[2]			X		X
-1CL-3, BO Checklist[2]				X	
TO 1C-135(*)*-1-1, Performance Manual		X[1]			X
TO 1C-135-1-1-1, FSA-CAS Manual[2]		X			
-1-1-1CL-1, Pilot Checklist[2]	X	X			
-1-1-1, Pacer CRAG Checklist[2]	X	X	X	X	
TO 1-1C-1, Basic Air Refueling (A/R)		X[1]			X
TO 1-1C-1-3, A/R Tanker		X[1]			X
-3CL-1, A/R Tanker Pilot/Nav Checklist[2]	X	X	X		
-3CL-3, A/R Tanker BO Checklist[2]				X	
TO 1-1C-1-14, A/R Receiver		X[1]			X
-14CL-1, A/R Receiver Pilot Checklist	X	X			
-14CL-2, A/R Receiver Nav Checklist			X		
-14CL-3, A/R Receiver BO Checklist				X	
TO 1C-135(K)A-9, Cargo Loading Manual				X	
-9CL-1, Cargo Loading Checklist				X	
AFI 11-202, Volume 3, *General Flight Rules*	X				
AFI 11-2KC-135, Volume 3, C/KC-135 Operations	X				
TO 1C-135(K)*(I)-1, Flight Manual KC-135 R/T[3]		X			
-1CL-1, Pilot Checklist[3]	X	X			
-1CL-2, Nav Checklist[3]			X		
-1CL-3, BO Checklist[3]				X	

* Denotes particular aircraft model.

1. Items not required to be carried by that individual when a flight engineer (FE) is onboard.
2. Not required on Pacer CRAG R/T model aircraft.
3. Required on Pacer CRAG R/T model aircraft.

Section 6B—Pre-departure.

6.5. Airfield Certification. All crewmembers and staff mission planners will review airport qualification audiovisual slide tape programs if available before operating missions into unfamiliar airfields. In addition, aircrews will review the Airfield Suitability and Restrictions Report (ASRR) and should contact HQ AMC/DOVS for updates to airfield operability and weight bearing capability. The latest information is available through the World Wide Web or through GDSS/C2IPS.

6.6. Aircrew Intelligence Briefing. Prior to leaving home station on missions departing the CONUS, crews will receive an intelligence briefing that will emphasize terrorist, enemy, and friendly political and military development in the area in which they will be flying. Once in theater, aircrews should receive intelligence updates on initial arrival at a forward operating location (FOL) or en route stop and thereafter when significant developments occur. Report information of possible intelligence value to the local intelligence officers at the completion of each mission.

6.7. Flight Crew Information File (FCIF) Procedures.

6.7.1. Review FCIF, volume 1, (index and safety-of-flight files, as a minimum) before all missions or ground aircrew duties. Update the FCIF currency record with the latest FCIF item number, date, and crewmember's initials or as specified.

6.7.2. Crewmembers delinquent in FCIF review or joining a mission en route will receive an FCIF update from a primary aircrew member counterpart on the mission. Instructor pilots who fly with general officers are responsible for briefing appropriate FCIF items.

6.7.3. Crewmembers not assigned or attached to the unit operating a mission will certify FCIF review by entering the last FCIF number and their initials behind their name on the file copy of the flight authorization.

6.7.4. PACAF ACs or supervisor-of-flying (SOF) will certify all go-no-go items are accomplished by polling primary crewmembers, and will sign either the flight orders or the mission briefing document for record.

6.8. Flight Crew Bulletins (FCB). PACAF Wings are not required to use FCBs. These directions apply in PACAF where FEBs are utilized.

6.8.1. FCBs are issued under provisions of AFI 11-202 Vol 2, *Aircrew Standardization/Evaluation Program* and MAJCOM supplements. Operations group Stan/Eval will be the OPR for FCBs. Items in FCBs may include local procedures and policies concerning equipment and personnel generally not found in any other publications.

6.8.2. All crewmembers should be cognizant of FCB contents.

6.9. Airfield Security. When departing on missions destined outside the CONUS, ACs should review applicable MAJCOM security publications.

6.10. Mission Kits. Carry mission kits on all operational missions (*Indicates mandatory for all missions away from home station). Suggested items include:

6.10.1. Publications:

*AFI 11-401 *Flight Management*

*AFI 23-202 *Buying Petroleum Products and Other Supplies and Services Off-Station*

*AFJI 11-204 *Operating Procedures for Aircraft Carrying Hazardous Materials*

*ATP 56 *Air to Air Refueling*

*Airfield Suitability and Restrictions Report (ASRR)

*AMC Aircrew Border Clearance Guide or MAJCOM Equivalent

*FCB

6.10.2. Forms:

DD Form 1351-2, **Travel Voucher or Sub voucher**

DD Form 1351-2c, **Travel Voucher or Sub voucher (Continuation Sheet)**

*DD Form 1854, **US Customs Accompanied Baggage Declaration**

DD Form 2131, **Passenger Manifest**

*CF 7507, **General Declaration (Outward/Inward)**

*AF Form 15, **United States Air Force Invoice**

*AF Form 315, **United States Air Force AV Fuels Invoice**

AF Form 457, **USAF Hazard Report**

*AF Form 651, **Hazardous Air Traffic Report (HATR)**

*AF Form 664, **Aircraft Fuels Documentation Log**

*AF Form 1297, **Temporary Issue Receipt**

*AF Form 3578, **Tanker Activity Report**

*AF Form 4041, **RC/EC/KC-135 Takeoff Data**

AF Form 4042, **Applied Restraint Computations**

*AF Form 4100, **KC-135 Load Planning Worksheet**

AF Form 4044, **KC-135 Cargo/Passenger Planning Data**

*AF Form 4045, **Navigation Report**

*AF Form 4047, **Celestial Precomputation**

*AF Form 4047, **Mission Flight Plan**

*AF Form 4048, **Mission Flight Log -**

AF Form 4094, **Mission Flight Continuation**

AF Form 4075, **Aircraft Load Data Worksheet**

HMS Customs Declaration

Japanese Customs Declaration

6.10.3. Orders:

DD Form 1610, **Request and Authorization for TDY Travel of DoD Personnel**

AF Form 1631, **NATO Travel Orders** (when required)

*AMC Form 41 **Flight Authorization.**

6.10.4. Miscellaneous:

*Box car seals

*Masking tape

6.11. Route Navigation Kits.

6.11.1. A route navigation kit is issued at home station and remains with the aircraft until return. Kits contain sufficient quantities of material to cover the planned mission and global operations as required.

6.11.2. Minimum contents of route navigation kits are as follows:

Figure 6.2. Route Navigation Kits.

Item (applicable to area of operation):	Number
FLIP GP Planning (sections GP, AP/1, AP/1B, AP/2, AP/3)	1
FLIP IFR Supplement	2
FLIP Flight Information Handbook	1
FLIP En route (high and low)	2
FLIP Instrument Approach Procedures (high and low)	3
Standard Instrument Departures (East and West United States, volumes 1 and 2)	3
Instrument Departures Europe and North Africa (high and low)	3
Standard Terminal Arrival Routes (STAR)	3
Topographical and Sectional Charts for areas of operation (GNC/OPC/TPC/JNC)	as req
FLIP VFR Supplement	1
DoD Area Arrival Charts	(2) if available

6.11.3. Local area navigation kits may be used in lieu of route navigation kits on local unit training sorties. Contents of these kits are a local unit decision.

6.12. Briefing Requirements.

6.12.1. Agency Briefing. The current operations branch conducts this briefing as a final aircrew briefing for special unit missions. It should be held if the takeoff is more than 6 hours after the initial briefing and no earlier than 6 hours prior to takeoff. Consider the crew rest provisions of AFI 11-202, Vol. 3 and this AFI in establishing the time for this briefing. The purpose of this briefing is to advise aircrews of the latest weather information and mission changes and review specialty information in the specialized briefing. Unit staff personnel should conduct the pre-takeoff briefing. All participating crewmembers and designated spares must attend the briefing. The briefing should be concise and not exceed 30 minutes. A recommended sequence of presentation follows; however, it may be varied or expanded to meet mission and unit requirements. (See **Chapter 16** of this AFI for further guidance.)

6.12.1.1. Time hack.

6.12.1.2. Briefing classification and room security.

6.12.1.3. Roll call.

6.12.1.4. Purpose of mission.

6.12.1.5. Weather briefing.

6.12.1.6. Aircrew aircraft assignment, parking location, tactical call signs, aircraft special configurations and loading, fuel loads, and the configuration and location of the spare aircraft, if applicable.

6.12.1.7. Cell composition and sortie assignment.

6.12.1.8. Takeoff performance data.

6.12.1.9. Timing and control times.

6.12.1.10. Start engines.

6.12.1.11. Takeoff.

6.12.1.12. Route of flight.

6.12.1.13. A/R control times.

6.12.1.14. Intended landing base.

6.12.1.15. Approaches.

6.12.1.16. Divert and abort procedures.

6.12.1.17. NOTAMs.

6.12.1.18. FCIF and FCB as appropriate.

6.12.1.19. Announcements.

6.12.1.20. Technical order changes.

6.12.1.21. Flying safety.

6.12.1.22. Transportation.

6.12.1.23. Special Briefing Items (Contact the local current operations or controlling agency [e.g. command post] to confirm mission requirements. Controlling agencies provide information necessary to complete mission planning. The AC and controlling agency jointly share responsibility to identify special briefing requirements. Briefings include, but are not limited to, buffer zone; electronic warfare activities; SAFE PASSAGE; MIJI; diplomatic clearance; hazardous cargo; airfield qualification program; tactics; anti-hijacking procedures [if different from standard]; operations and safety supplements to flight manuals [if issued within last 72 hours], and specialized procedures for JCS contingency operations, ORIs, etc.)

6.12.1.24. Commander's remarks.

6.12.2. AC Briefing. Brief crewmembers on the specific mission details if not previously accomplished.

6.12.2.1. Time hack.

6.12.2.2. Briefing classification for the mission profile.

6.12.2.3. Review weather.

6.12.2.4. Mission itinerary and profile.

6.12.2.5. Aircraft tail number and call sign.

6.12.2.6. Aircraft gross weight and fuel load.

6.12.2.7. Communications requirements and procedures.

6.12.2.8. Fuel reserve.

6.12.2.9. Review departure and approach to be flown.

6.12.2.10. Airdrome restrictions and hazards.

6.12.2.11. Emergency procedures review.

6.12.2.12. Specialized briefings (formation tactics, A/R, etc.).

6.12.2.13. C2 and execution procedures.

6.12.2.14. Pacer CRAG, specify 3-Person or 4-Person operations, and crew responsibilities for each.

6.12.2.15. MPRS, specify boom receptacle and/or A/R Pod refueling operations, and crew communication responsibilities for each.

6.12.3. Specialized Briefing. Specialized briefings should be held immediately following the agency or AC's briefing as required. Specialized briefings review formation tactics and procedures, air refueling information, and technical instructions for specialized equipment operations. All crewmembers and appropriate staff must attend each briefing. Boom operators may be excused from specialized briefings for cargo loading, however the AC will back brief all appropriate items. Types of specialized briefings include:

6.12.3.1. Formation.

6.12.3.2. Air Refueling. As a minimum, the following should be briefed:

6.12.3.2.1. Rendezvous (RZ) and orbit time, RZ Point, altitude, heading, airspeed, end A/R point, and secondary plan.

6.12.3.2.2. Equipment for primary and secondary RZ.

6.12.3.2.3. Color codes for anti-collision lights.

6.12.3.2.4. Scheduled fuel on-load and off-load.

6.12.3.2.5. Communications and emission control.

6.12.3.2.6. Review of emergency procedures, to include breakaway.

6.12.3.2.7. Review of operating procedures (including use of manual, override, and emergency boom latching).

6.12.3.2.8. Review spare tanker and abort procedures.

6.12.3.2.9. For Pacer CRAG, FMS configuration and operations for rendezvous and refueling.

6.12.3.2.10. For MPRS, Receiver A/R Pod refueling flow procedures.

6.12.3.3. Cargo and load information.

6.12.3.4. Special instructions.

6.12.4. Weather Briefings. Request a written weather briefing on DD Form 175-1**, Flight Weather Briefing**, AMC Form 181, **AMC Mission Weather Briefing**, or other approved MAJCOM form (**Exception**: Verbal weather briefings are acceptable for pattern only missions). Obtain a briefing on current weather, trends, and forecast for the proposed route, destination, and alternates. If the flight will transit non-Air Force bases, crews must make arrangements to ensure adequate weather support facilities and services are available. If adequate services are not available crews will obtain weather support through any means available to ensure required weather data is in their possession prior to mission accomplishment. When face-to-face briefings are not possible or are impractical, obtain a telephone weather briefing (precedence up to and including IMMEDIATE is authorized). The designated MAJCOM regional briefing stations provide the telephone briefing for CONUS flights.

6.12.4.1. Obtain weather information from US Military weather services, any FAA-approved weather source, or any host nation civil or military weather source.

6.12.5. Buffer Zone. Prior to operating an aircraft within or adjacent to an established buffer zone, the pilot will ensure primary crewmembers are briefed on current buffer zone procedures outlined in appropriate directives.

6.12.6. Peacetime and Wartime SAFE PASSAGE Procedures. Pilots must be familiar with peacetime and wartime safe passage of friendly military aircraft (if applicable).

6.13. Call Signs.

6.13.1. Training Missions. Aircraft will use the unit static call sign prefix followed by a 2-digit suffix assigned by the parent unit.

6.13.2. Operational Missions. Aircraft will use call signs assigned by OPORD, FRAG, or diplomatic clearance. If no call sign has been assigned to the mission, use unit static call signs. When flying AMC channel missions, aircraft will use the “REACH” call sign followed by the last digit of the year the aircraft was built and the last 3 digits of the aircraft tail number (or as required by diplomatic clearance). Complete flight plans as follows:

6.13.2.1. On the DD Form 1801, item 7, put the letters "rch" followed by the last digit of the year the aircraft was built and the last 3 digits of the aircraft tail number.

6.13.2.2. On the DD Form 1801, item 18, remarks section, put “rem / rch designates Reach call sign.”

6.13.2.3. On the DD Form 175 **Military Flight Plan,** aircraft call sign block, put “rch” followed by the last digit of the year the aircraft was built and the last 3 digits of the aircraft tail number.

6.13.2.4. On the DD Form 175, remarks block, put “rch designates Reach call sign”

6.13.3. During radio transmissions, crews will use "Reach" followed by the last digit of the year the aircraft was built and the last 3 digits of the aircraft tail number.

6.13.4. Reach 01, 15, and 21 call signs will only be used by the AMC/CC, 15 AF/CC, and 21 AF/CC respectively.

6.14. Instrument Flight Rules. Conduct flight operations under IFR to the maximum extent possible without unacceptable mission degradation. This does not preclude VFR training to maintain proficiency in mission essential VFR operations.

6.15. Flight Data Verification.

6.15.1. Aircrews should acquaint themselves with the mission and individual sortie requirements to ensure successful mission accomplishment. Wing and squadron staff should monitor crew activity and be available to resolve problem areas.

6.15.2. Computer Flight Plan (CFP) Use. Contracted CFPs or CFPs available from Det 1, AMC CPSS are the official sources of performance, navigation, and climatic data, including en route wind information. If stand-alone microcomputer based plans are used, each mission segment should utilize best wind data available. Only current, command validated (HQ AMC/DOV) microcomputer programs will be used for flights involving KC-135 aircraft.

6.15.3. Flight crews may manually compute flight plans, use mainframe based or contracted CFPs, or utilize CFPs provided by the staff. CFPs should be utilized to the maximum extent practical. The flight crew has final responsibility for accuracy of the flight plan used.

6.15.4. The flight crew for route definition and fuel computation accuracy prior to departure will verify CFPs. Range summary charts in section 5 of the performance manual will be used to determine the validity of CFP fuel burn rates. Pass any flight plan discrepancies to the TACC. When reporting incorrect flight plans to the TACC (Flight Planning Office), include both the CFPI and the plan number.

6.15.5. All takeoff and landing data computations will be reviewed by another crewmember. For aircraft with FMAC, computer data will be used as a mission-planning tool; the data computer on the FMAC will be used, to the maximum extent possible, for flight. For aircraft with MPRS, ensure added A/R pod weight does not invalidate takeoff data, and ensure adequate three-engine climb gradient for critical and/or normal takeoffs.

6.15.6. For Pacer CRAG, ensure that the DAFIF image file on FMS PCMCIA card will be current for date(s) of flight. If DAFIF file is not current, only geographic coordinates should be used for navigation, since using it for other than geographic coordinates is the equivalent to flying with outdated FLIP.

6.16. Departure Planning:

6.16.1. Gross Weight. Ensure that the aircraft does not exceed the maximum gross weight, zero wing fuel weight, or CG limitations specified in the aircraft flight manual. Gross weight may be further restricted by operating conditions such as weather, runway conditions and length, airdrome weight bearing capacity, required climb gradients, and obstacles.

6.16.2. Departure Routing/Climbout Procedures. Appropriate terrain charts must be reviewed prior to departure. Regardless of the type of departure flown (SID, Specific ATC Departure Instructions, IFR Departure Procedure, or VFR), the aircraft must be able to achieve the published climb gradient (for the runway to be used) with all engines operating, and be able to vertically clear all obstacles within the climbout flight path with one engine inoperative. If no minimum climb gradient is published, use 200 ft/NM minimum with all engines operating. Subtract 48 ft/NM from published climb gradients to find the required obstacle gradient for unpublished obstacles. Only fields having a pub-

lished instrument approach have conducted an obstacle survey. If the field does not have a published instrument approach, then no obstacle survey has been conducted and an IFR departure is not authorized.

6.16.2.1. SIDs. OPRs for SIDs are identified on each individual SID. They are Federal Aviation Administration (FAA), United States Army (USA), United States Navy (USN), United States Marine Corps (USMC), or United States Air Force (USAF). On non-DoD SIDs, the agency that wrote the SID will also be identified (in parentheses immediately to the right of the Chart Reference Number). For example: SL-000.00 (USA) would indicate a DoD SID where the US Army is both the OPR and the agency that wrote the SID. (USAF) SL-000.00 (RAF) would indicate a non-DoD SID where the USAF is the military department that requested publication and serves as the OPR, but the Royal Air Force is the agency that wrote the SID. Use the agency that wrote the SID to determine the required screen height.

6.16.2.2. Published IFR Departure Procedures. Published IFR Departure Procedures are available at some civil and military fields to assist in avoiding obstacles during climb to the minimum en route altitude (MEA). Airfields with Published IFR Departure Procedures will have the inverted triangle with a white "T" symbol printed on the approach plates and SIDs. When using Jeppesen publications, IFR Departure Procedures will be on the airfield diagram page, which is typically on the reverse side of the airport's first approach. A climb gradient and/or specific routing and/or alternate takeoff weather minimums will normally be specified with a Published IFR Departure Procedure. When flying a Published IFR Departure Procedure depicted routing and climb gradients must be flown to avoid obstacles. The alternate takeoff weather minimums allow aircraft to depart with minimum ceiling and visibility. The KC-135 is not authorized to use these alternate takeoff weather minimums.

NOTE: If the Published IFR Departure Procedure does not include either a routing or a minimum climb gradient (i.e., it includes only alternate takeoff weather minimums) then an IFR departure from that airfield IS NOT AUTHORIZED unless you fly a SID or depart via radar vectors.

6.16.2.3. Specific ATC Departure Instructions (Specific climbout instructions or "radar vectors"). Crews may depart via specific ATC departure instructions, however, the SID prescribes a safe route of flight for a climb to the en route structure, while minimizing radio communication. Even if you plan to depart via specific ATC departure instructions, the crew should still have the SID on board (if published).

6.16.2.4. VFR Departures. VFR departures are authorized when required for mission accomplishment. The weather at takeoff must permit a VFR climb to an IFR MEA, an appropriate IFR cruising altitude, or an altitude where radar vectors can be provided.

NOTE: In no case will VFR departures be flown in lieu of obstacle clearance planning.

6.16.3. Screen Heights Requirements. From a performance computation point of view, required screen heights are in essence obstacles and will be treated as such in addition to any other physical obstacles for the departure. Decrease the runway available by that distance required to reach the DER at the required screen height. This distance can be computed from the climbout flight path charts in the performance manual. Use the following, as a guide to determine required screen heights.

NOTE: Screen height requirements for departures depend on the agency that wrote the departure and/or the airfield where the departure is being flown (for SIDs, identified in parenthesis immediately to the right of the SID Chart Reference Number). There is no standard or easy way for crews to determine required

screen height requirements in some cases. Therefore, when using departures other than those listed below, or when any doubt exists about which screen height to use, plan to cross the DER at 35 feet (minimum) unless you can ascertain a different screen height requirement from the appropriate authority.

Figure 6.3. Screen Heights for SID.

Agency	Screen Ht.
USAF, USN, or USMC SID:	0 ft.
US Army and FAA SID:	35 ft.
Foreign Civil SID (must be an ICAO member nation listed in FLIP GP):	16 ft.
Foreign Military SID (NATO, ICAO member nation listed in FLIP GP):	35 ft.
Foreign Military SID (Non-NATO, ICAO member nation listed in FLIP GP):	16 ft.

Figure 6.4. Screen Heights for Radar Vectors, Published IFR Departure Procedures or VFR Departures.

Agency	Screen Ht.
USAF, USN, or USMC Airfield:	0 ft.
US Army and FAA Civil Airfield:	35 ft.
Joint Use Airfield with the United States:	35 ft.
Foreign Civil Airfield (must be an ICAO member nation listed in FLIP GP):	16 ft.
Foreign Military Airfield (NATO, ICAO member nation listed in FLIP GP):	35 ft.
Foreign Military Airfield (Non-NATO, ICAO member nation listed in FLIP GP):	16 ft.

6.16.3.1. Unable to Meet Required Screen Height. In accordance with AFMAN 11-217, Vol 1, *Instrument Flight Procedures*, if aircraft performance prohibits aircraft from meeting the required screen height, the proposed route of flight must be examined using current aeronautical and terrain charts to ensure aircraft performance is sufficient to clear all obstacles.

6.17. Obstacle Clearance Planning:

6.17.1. Obstacle Identification Surface (OIS). Obstacle identification for SID purposes (FAA Handbook 8260.3B, AFJMAN 11-226, *US Standard for Terminal Instrument Procedures (TERPS),* are those objects that penetrate an OIS of 40:1 (152 feet per NM). Calculation of the OIS on a SID continues until the SID reaches a MEA or until the SID terminates. Climb gradients of 200 feet per NM will provide at least 48 feet per NM clearance above all obstacles that do not penetrate the OIS. Complying with published climb gradients found on a SID or IFR departure procedure will provide at least 48 feet per NM clearance above all obstacles that do penetrate the OIS. The AC must be aware and thoroughly brief the crew on all obstacles along the departure flight path.

6.17.1.1. The AMC Airfield Suitability and Restrictions Report (ASRR) is an excellent source for obstacle information, however, it is not a stand-alone document. It is intended to supplement published climb gradients and obstacle information found on SIDs, Published IFR Departure Procedures, and terrain charts.

6.17.1.2. Aircrews may call HQ AMC/DOVS for additional airfield obstacle data.

6.17.2. Objects penetrating the OIS may or may not be depicted. (They definitely will not be depicted on civil procedures.) Objects, which do not penetrate the OIS, will not normally be depicted.

6.17.3. SIDs simplify ATC procedures while providing safe routing to the en route structure; however, SIDs should not be used as the sole source of obstacle information for departure planning. If used as such, inadequate (engine out) obstacle clearance may result. SIDs, instrument approach plates, and topical sectional charts, must be used to determine the distance and height values for all significant obstacles along the flight path.

6.17.4. The controlling obstacle is defined as the obstacle requiring the greatest climb gradient within the flight path. Obstacles are not normally depicted on SIDs when climb gradients of less than 152 feet per NM are required to clear them.

6.17.5. Climbout Performance. The aircraft must be able to vertically clear all obstacles within the climbout flight path with one engine inoperative. In order to fly an IFR departure, the aircraft must be capable of attaining the required climb gradients or rates of climb published for all engines operating.

6.17.5.1. If 3-engine climb gradient meets or exceeds the published required climb gradient (200 ft/NM if none published), aircrews may depart using the planned IFR departure procedure.

6.17.5.2. If the 4-engine climb gradient exceeds the required climb gradient, but the 3-engine climb gradient does not, then you may still depart provided the 3-engine climb gradient provides obstacle clearance. In the event of an engine failure, aircrews will advise ATC of their inability to comply with the required climb gradient.

NOTE: In this case, a decreased margin of safety exists.

6.17.6. If the aircraft is unable to vertically clear all obstacles engine out, the crew will consider the following: (1) Downloading cargo, (2) Downloading fuel, and (3) Delaying the mission until climatological conditions allow for sufficient performance.

NOTE: These procedures do not affect guidance for clearing end-of-runway obstacles, or restrictions in the ASRR.

6.18. Alternate Planning.

6.18.1. Choose alternates that best meet mission requirements and conserve fuel. Those selected should not be within the same terminal area, if terminal forecasts are marginal. Select alternates that are not restricted by FLIP, FCG, or diplomatic clearances and are compatible with the mission load and performance characteristics of the aircraft.

6.18.2. The AC retains final authority in the choice of alternates; however, selection by support agencies normally should be used if they meet the above criteria and the aircraft has already been serviced.

6.18.3. Alternates selected must meet the alternate airport weather requirements according to AFI 11-202, Volume 3.

6.19. Departure Alternates.

6.19.1. A departure alternate is required if ceiling or visibility is below landing minimums for an available approach (at departure aerodrome).

6.19.2. Suitability of Departure Alternates. When departure alternate is required, the aircraft must be capable of maintaining the MEA or MOCA, whichever is higher, to the alternate using one engine out performance criteria. To qualify as a departure alternate the airfield must meet one of the following conditions:

6.19.2.1. Existing weather at an alternate within 30 minutes flying time must be equal to or better than the published approach minimums and forecast to remain so until 1 hour after takeoff, but in no case forecast to be lower than 200-1/2 (RVR 2400), or;

6.19.2.2. The existing weather at an alternate within 2 hours flying time must be at least 500-1 above the lowest compatible published approach minimums, but in no case lower than 600-2 for a precision approach or 800-2 for a non-precision approach, and forecast to remain so for 1 hour after ETA at the alternate.

6.20. Destination Requirements. (*for filing purposes*). The forecast destination weather will be according to AFI 11-202, Volume 3 and the following:

6.20.1. File two alternates when:

6.20.1.1. The forecast weather (intermittent or prevailing) is less than required minimums for the lowest compatible approach.

6.20.1.2. The forecast surface winds (intermittent or prevailing) exceed limits corrected for RCR.

6.20.2. File an alternate, regardless of forecast weather, when the departure or destination aerodrome is outside the 48 conterminous states.

6.20.3. When filing to a remote or island destination, aircrews may use 1 + 15 holding fuel (in lieu of an alternate). Compute holding fuel using planned destination gross weight at FL 200. A remote or island destination is defined as any aerodrome which, due to its unique geographic location, offers no suitable alternate (civil or military) within 2 hours flying time. The forecast weather at the remote or island destination must meet the following criteria:

6.20.3.1. The prevailing surface winds, corrected for RCR, must be within limits at ETA and forecast to remain so for 2 hours thereafter, **and**

6.20.3.2. The prevailing ceiling and visibility must be equal to or greater than published minimums for an available non-precision approach, for ETA plus 2 hours.

NOTE: If a DoD or NOAA precision approach is available, the ceiling or visibility may be intermittently below non-precision approach minimums, but not below precision approach minimums (for ETA plus 2 hours).

6.20.4. When filing to a destination where the alternate is located in Alaska or at latitudes greater than 59 degrees, carry an additional 30 minutes of holding fuel. In this case, the minimum planned fuel overhead planned destination would include fuel for approach/landing, alternate/missed approach, fuel reserve, and 30 minutes holding fuel. Compute holding fuel using planned destination gross weight, FL200.

6.21. Adverse Weather.

6.21.1. Refer to AFI 11-202, Volume 3 for takeoff with ice or frost. Do not takeoff under conditions of freezing rain or freezing drizzle.

6.21.2. Refer to the flight manual for guidance on the use of de-icing fluids.

6.21.3. During flight, use any means available to avoid thunderstorms by at least:

6.21.3.1. 20 NMs at or above flight level (FL) 230.

6.21.3.2. 10 NMs below FL 230.

6.21.3.3. Aircrews should avoid flying in areas of recently dissipated thunderstorms and advected clouds downwind of thunderstorms. Crew actions should err on side of safety.

6.21.3.4. The use of ground-based radar as a means of thunderstorm avoidance should be used only to assist in departing an inadvertently penetrated area of significant weather. It should never be considered a normal avoidance procedure.

6.21.4. Do not fly directly above (within 2,000 feet) thunderstorms or cumulonimbus clouds. If unable to vertically clear thunderstorms or cumulonimbus clouds by at least 2000 feet, you must avoid them by using the above criteria.

NOTE: Aircraft damage may occur 20 miles or more from any thunderstorms. Aircrews must familiarize themselves with information on thunderstorm development and hazards. Refer to AFJH 11-203, *Weather for Aircrew*s.

6.21.5. In order to minimize exposure to thunderstorm hazards when approaching or departing an airport in an area where thunderstorms are occurring or are forecast:

6.21.5.1. Attempt to maintain VMC.

6.21.5.2. Maintain at least 5 NMs separation from heavy rain showers.

6.21.5.3. Avoid areas of high lightning potential, i.e. clouds within plus or minus 5,000 feet of the freezing level.

NOTE: Approaches or departures may be accomplished when thunderstorms are within 10 NMs. The thunderstorms must not be producing any hazardous conditions (such as hail, lightning, strong winds, gusts fronts, heavy rain, wind shear, or microburst) at the airport, and must not be forecast or observed to be moving in the direction of the route of flight (to include the planned missed approach corridor, if applicable).

6.21.6. Aircrews performing approaches and landings at locations where temperatures are 0 degrees centigrade or below will refer to the Flight Information Handbook, section D, Temperature Correction Chart, to correct minimum descent altitude (MDA), decision height (DH), and other altitudes inside the final approach fix (FAF) if required.

6.21.7. Mountain Wave Turbulence. Do not fly into an area of known or forecast moderate or greater mountain wave turbulence. Crews should use good judgment when flying into any area conducive to mountain wave turbulence, and avoid these areas of potential turbulence when possible.

6.21.7.1. Mountain wave turbulence is normally a predictable condition. Forecasters at base weather stations, using guidance products from weather centers, can advise crews of the potential for encountering mountain wave turbulence along planned routes of flight.

6.21.7.2. Weather data availability in mountainous regions and forecast model limitations prevent the prediction of all events.

6.21.7.3. Crews must be familiar with the causes of mountain wave turbulence and the characteristic clouds that generally forewarn its presence.

6.21.8. Flight into areas of forecast or reported severe icing or severe turbulence is prohibited.

6.21.9. SIGMETs. National Weather Service in-flight weather advisories are not limiting to Air Force aircraft but may indicate a need for the aircrew to contact a military weather facility. Crews will consider all SIGMETs valid for their aircraft until verified as not applicable with a military METRO service.

6.21.10. Maximum crosswind for takeoff or landing is during peacetime is 25 knots. RCR may limit this capability. If mission requirements dictate, the OG/CC may authorize launch or recovery of aircraft within the maximum flight manual limitations.

6.21.11. For Pacer CRAG: The Predictive Wind Shear (PWS) function of the weather radar should normally be operating for all takeoffs, approaches, and landings. Weather radar information will be displayed on one of the pilot Multifunction Displays (MFDs) during takeoffs, approaches, and landings to facilitate any actions necessary to avoid the hazard.

6.22. Fuel Conservation.

6.22.1. Conservation of fuel requires everyone's active participation. For every pound of excess fuel, 3 percent of the excess will be burned each hour. Do not carry extra fuel for convenience. Unidentified extra fuel should not exceed required ramp fuel load (RRFL) by more than 10,000 pounds.

6.22.2. Extra fuel (identified extra) may be added to RRFL: (1) When fuel availability is limited or not available at en route stops, (2) For known holding delays in excess of standard, (3) For anticipated off course weather avoidance, or (4) When escorting fighters where reliable wind data or receiver profiles are not available.

6.22.3. Planning instructions for fuel conservation:

6.22.3.1. Use optimized CFPs when possible.

6.22.3.2. Airlift missions. Maximum range cruise (MRC) and optimum altitude should be flown.

6.22.3.3. Tanker Mission. Plan to and from the A/R track or anchor at MRC and optimum altitude.

6.22.3.4. Fighter Escort Mission. Plan airspeeds and altitudes at optimum, consistent with receiver requirements.

6.22.3.5. Limit the use of the APU when possible.

6.22.3.6. Delay engine start (normal engine start is 15-20 minutes prior to takeoff).

6.22.3.7. Cruise CG should be aft if practical.

6.22.3.8. Fly en route descents when possible.

6.22.3.9. Raise boom and close sighting window between multiple ARCTs when feasible.

6.22.4. Fuel loads.

6.22.4.1. Units may develop standard ramp loads that meet the minimum local training mission requirements or emergency evacuation requirements (whichever is less).

6.22.4.2. De-fuel will not be required if RRFL is less than the standard ramp fuel load.

Section 6C—Preflight

6.23. AFTO Form 781, AFORMS Aircrew/Mission Flight Data Document. Review AFTO Form 781 before applying power to the aircraft or operating aircraft systems. The exceptional release must be signed before flight. A maintenance officer, maintenance superintendent, or authorized civilian normally signs the exceptional release. If one of these individuals is not available, the aircraft commander may sign the exceptional release. Ensure that the DD Form 1896, **Jet Fuel Identaplate**, and AIR card is aboard the aircraft.

6.24. Aircraft Servicing and Ground Operations.

6.24.1. Aircraft Refueling. Aircrew members' current in aircraft servicing (G190) may augment qualified refueling supervisors. The aircraft servicing course does not qualify crews to perform maintenance tasks. Aircrew members are not authorized to serve as refueling supervisors, only qualified transient alert and maintenance personnel may serve as refueling supervisors.

6.24.2. Concurrent Ground Operations. Concurrent ground operations (simultaneous refueling or defueling while maintenance operations are being performed) will be in accordance with TO 00-25-172. Concurrent servicing with passengers and cargo has not been evaluated and, therefore, is not approved according to T.O. 00-25-172.

6.24.3. Movement into or within the safe area must be under control of the chief servicing supervisor (CSS). Individuals must properly ground themselves before boarding the aircraft or handling fuel-servicing equipment. Concurrent servicing, and maintenance must be conducted according to T.O. 00-25-172 and current checklists, which will be reviewed before concurrent operations.

6.25. Aircraft Recovery Away from Main Operating Base (MOB). When an aircraft will land at a base other than the MOB, crew chiefs should accompany the aircraft. The AC is responsible for ensuring the aircraft is turned to meet subsequent mission taskings, however aircrew members will not serve as refueling supervisor or perform maintenance tasks.

6.25.1. Recovery items the AC may be responsible for include, but are not limited to, the following: (1) Parking and receiving, (2) Ensuring the aircraft is serviced, including AGE usage, (3) Supervision of minor maintenance within local capability, (4) Minor configuration changes to meet mission tasking, (5) Securing the aircraft prior to entering crew rest, (6) Coordinating aircraft security requirements, and (7) AFTO 781-series forms maintenance.

6.25.2. In all cases the aircraft will be turned in accordance with the appropriate maintenance tech order.

6.25.3. Aircrews are not qualified to accomplish the required ground inspections. In those instances where maintenance personnel are not available, the aircrew will enter a red dash symbol in the AFTO Form 781H **Aerospace Vehicle Flight Status and Maintenance Document**, updating current status and enter a red dash symbol and a discrepancy that reflects that the applicable maintenance inspection (i.e. preflight, thru-flight, basic post-flight) is overdue.

6.26. Oxygen Requirements.

6.26.1. The minimum quantity of oxygen aboard an aircraft before takeoff must be sufficient to accomplish the planned flight from the equal time point (ETP) to recovery should oxygen be required. Calculate using the 100-percent oxygen chart in the flight manual.

6.26.2. For flights with passengers onboard, the intended route of flight must be carefully examined to ensure that there is sufficient fuel on board to allow for the following:

6.26.2.1. A loss of cabin pressurization (from any position along the route).

6.26.2.2. An emergency descent to 10,000 feet MSL.

6.26.2.3. Continued flight at 10,000 feet MSL to the nearest available emergency airfield.

6.26.3. All crewmembers comply with AFI 11-202, Volume 3. Navigators, NSOs, and boom operators comply with “other flight deck crew” requirements while at their duty stations. All crewmembers occupying or transiting the cargo compartment will comply with “cabin/cargo area crew” requirements.

6.26.4. Boom operators performing air refueling duties may have the MA-1 portable oxygen bottle, or aircraft oxygen system, with helmet and mask or quick-don assembly attached, as their readily available oxygen.

6.27. Fleet Service Equipment. Ensure required fleet service items are aboard. Fleet service items must be aboard the aircraft early enough to permit inventory 30 minutes before takeoff time.

6.28. Cargo Documentation. Proper cargo documentation must accompany each cargo load. A cargo manifest is required prior to all departures with cargo aboard. If a computerized cargo manifest is not available at the manifesting station, a cargo listing will accompany the load. The cargo or mail listing may be an abbreviated manifest, but will contain all required MILSTAMP data and 463L pallet information for weight and balance purposes. A Shipper’s Declaration for Dangerous Goods is required for hazardous cargo. A DD Form 1387-2, **Special Handling Data Certification**, is required for sensitive/classified/signature service cargo.

6.29. Procedures for Airlifting Hazardous Cargo.

6.29.1. The term "hazardous cargo" as used in conjunction with airlift operations applies to the following classes and types of materials covered by AFJMAN 24-204:

Class 1 (Explosives)

Class 2 (Compressed gas)

Class 3 (Flammable liquid)

Class 4 (Flammable solid)

Class 5 (Oxidizer and organic peroxide)

Class 6 (Poison and infectious substances)

Class 7 (Radioactive material)

Class 8 (Corrosive material)

Class 9 (Miscellaneous dangerous goods)

6.29.2. Procedures in this paragraph apply when aircraft carry any quantity of the following materials:

DoD class/division 1.1, 1.2, 1.3 (explosives)

Class/division 2.3 (poison gas)

Class/division 6.1, (poison) PG I, zone A and B

Class 7 (radioactive yellow III label.)

Class 4.3 (dangerous when wet)

Nuclear weapons, nuclear components, inert devices

DoD hazard class/division 1.4 explosives (all weights) that transit the UK, Italy, or Hawaii.

6.29.3. Procedures apply to nuclear related cargo, toxic chemical ammunition, highly toxic substances, hazard division 1.4 explosives, and infectious substances (including biological and etiological materials). In addition it applies to Class 7 (Radioactive materials) which require a yellow III Label, and all other hazard classes or divisions, (except class 9 and Other Regulated Material (ORM-D)) when shipped in quantities of 1,000 pounds (455 kg) or more aggregate gross weight.

6.29.4. The following procedures are established to satisfy the reporting requirements of AFJI 11-204, *Operational Procedures for Aircraft Carrying Hazardous Materials*. (Nuclear weapons, nuclear components, and inert devices are covered in AFI 11-299, *Nuclear Airlift Operations*):

NOTE: Quantities not covered in paragraphs **6.29.2.** and **6.29.3.** are exempt from these procedures.

6.29.4.1. The AC will be briefed on the following information concerning hazardous materials placed aboard the aircraft:

6.29.4.1.1. Proper shipping name (PSN).

6.29.4.1.2. Hazard class.

6.29.4.1.3. Identification numbers.

6.29.4.1.4. The total quantity of hazardous cargo in gross weight or volume (except for class 9, ORM-D, and consumer commodities).

6.29.4.1.5. The location of hazardous item(s) in the aircraft.

6.29.4.1.6. DoD class/division when any type explosives are involved.

6.29.4.1.7. Net Explosives Weight (NEW) for all explosives aboard the aircraft.

6.29.4.1.8. The requirement for escorts, couriers and protective equipment.

6.29.4.1.9. The number of passengers permitted aboard the aircraft.

6.29.4.1.10. The procedures to use in an emergency.

6.29.4.1.11. All cargo being carried under the terms of a DOT exemption, a DoD certification of equivalency (COE), a CAA, or a waiver.

6.29.4.1.12. Written notification indicating "Prior Permission Required" (PPR), obtained from the next base to be transited.

6.29.4.1.13. Flight plan annotation requirements.

6.29.4.1.14. Isolated parking and taxiing requirements.

6.29.4.1.15. Security classification, if appropriate.

6.29.4.1.16. Notification of the requirement to contact the next base to be transited at least 30 minutes prior to landing. (Such contact is not required for quantities other than those in paragraphs **6.29.2.** and **6.29.3.**).

6.29.4.1.17. Placard requirements.

6.29.4.1.18. Other special handling requirements.

6.29.4.2. Cargo documentation. The boom operator will ensure proper documentation, certification and identification of cargo is furnished. AFJMAN 24-204 contains detailed instructions on packaging, marking, labeling, and certification requirements associated with the airlift of hazardous materials.

6.29.4.3. Flight Planning. When briefed according to paragraph **6.29.4.1.**, the AC will:

6.29.4.3.1. Enter "Hazardous Cargo" and the mission identifier or flight number in the appropriate section of the flight plan. Refer to FCG for country specific requirements concerning over-flight when transporting HAZMAT. (Use remarks section of DD Form 175 and other information section of DD Form 1801.)

6.29.4.3.2. If possible, plan the flight to minimize over-flying heavily populated or otherwise critical areas. Approach, landing, and takeoff tracks are excluded.

6.29.4.3.3. Prepare a departure message at stations when a C2 center is not available. The remarks section of the departure message should include the following information:

6.29.4.3.3.1. Class of hazardous material aboard and the DoD class or division for explosives and NEW. Include the gross weight for the materials in paragraph **6.29.3.**.

6.29.4.3.3.2. Request for special handling; for example, isolated parking, security, technical escort teams, etc.

6.29.4.3.4. If estimated time en route (ETE) is less than 1 hour, or if other circumstances preclude timely message receipt at destination, notify the base of first intended landing by priority telephone of the ETA and information listed in paragraph **6.29.4.3.3.**. Ask the C2 center at the departure base to relay this information to base operations at the point of first intended landing when a C2 center is available.

6.29.4.4. Before engine start. Remove placards, when used, from the aircraft. Give the controlling agency parking location, approximate engine start time, and verify the fire fighting agency has the hazardous materials information; otherwise, request the following be relayed to the fire fighting agency: (1) Class of hazardous material aboard and the DoD class or division for explosive materials aboard, (2) NEW for DoD class or division 1.1, 1.2, and 1.3 explosives, and (3) Estimated time of departure.

6.29.4.5. En route. Normal procedures apply. Comply with paragraph **6.29.4.3.2.**

6.29.4.6. Before landing. Unless specifically prohibited by the theater commander, FCG, or FLIP planning, contact the agency specified in FLIP, base operations dispatcher, control tower or approach control at least 30 minutes (or as soon as practical) before ETA to announce that "hazardous materials" are aboard and to verify that the hazardous cargo message has been received.

Transmit the mission number, ETA, and information in paragraph **6.29.4.3.3.** Request the information be relayed immediately to base operations or the civil airport manager, crash and fire protection agency, and other support activities. If landing at a CONUS civil airport without a tower, give the above information to the nearest FAA flight service station.

6.29.4.7. DoD requires aircraft carrying DoD class or division 1.1, 1.2, and 1.3 explosives, hazardous class or division 2.3 or 6.1 zone A materials, and munitions to be parked in areas isolated from non-associated personnel and facilities. When such cargo is aboard, ACs are responsible for ensuring cargo is correctly identified to the tower or ground control. When aircraft are not directed to an isolated area, identify the cargo again to tower or ground control. When identification is acknowledged, the host is solely responsible for selecting the parking area. Should host procedures be questionable, submit trip reports or hazard reports as appropriate, to document such occurrences.

6.29.4.8. The military host is responsible for placarding aircraft. When missions operate on non-military bases, the briefing to the AC will include placarding requirements and, if required, placards will be furnished at the on-load base. The shipper and receiver must make prior arrangements with the airport manager for shipments of hazardous materials requiring placarding. The shipper and receiver are responsible for cargo identification, fire fighting procedures, and isolated parking requirements.

6.29.4.9. Unscheduled Landing Due to in-flight Emergency. Transmit unclassified information to the appropriate ATC facility as follows:

6.29.4.9.1. Nature of emergency and intent to land.

6.29.4.9.2. Aircraft position and ETA.

6.29.4.9.3. Number of personnel and location in aircraft.

6.29.4.9.4. Fuel on board.

6.29.4.9.5. Hazardous materials aboard, location of the cargo, and applicable information listed in paragraph **6.29.4.3.3.**

6.29.4.10. After Unscheduled Landing. Contact the TACC by telephone, HF radio, or message, giving arrival notice, hazardous materials information, and other pertinent information, as required.

6.30. Handling of Classified Cargo, Registered Mail, NMCS/VVIP/FSS Shipments, and Courier Materialp.

6.30.1. Receipts will be obtained for classified cargo, NMCS/VVIP/FSS shipments, and registered mail at the on-load and off-load station using the cargo manifest.

6.30.1.1. Defense Courier Service (DCS) couriers coordinating with the aircraft commander are authorized to designate officer or enlisted, (E-5 and above) crewmembers on military aircraft as couriers to escort and safeguard courier material when other qualified personnel are not available. Qualified passengers, if carried, are designated prior to designating crewmembers. The following restrictions apply:

6.30.1.1.1. Primary crewmembers will not be designated without the consent of the AC.

6.30.1.1.2. Crewmembers will not be designated as couriers on aircraft scheduled to stop at locations where DSC couriers cannot provide en route support. This does not relieve the AC of the responsibility for life and death urgent shipments.

6.30.2. During stops at en route locations supported by DSC stations, DSC couriers are required to meet designated couriers to protect the material.

6.30.2.1. During unscheduled stops, crewmembers may place courier material in temporary custody of the following agencies listed in descending order of priority: (1) DSC courier, (2) TOP SECRET control officer of the US armed forces, (3) US Department of State diplomatic courier, (4) US Department of State activity, (6) US military guards, (7) US DoD civilian guards.

6.30.3. If unable to follow the itinerary to the destination of the courier material, or if material is lost, stolen, or otherwise compromised, report circumstances to the nearest armed forces courier station and notify the local US military commander or US government activity.

Section 6D—Departure

6.31. On Time Takeoffs. Mission departures are on time if the aircraft is airborne within 20 + 14 minutes of scheduled takeoff time.

6.31.1. A/R Missions. Scheduled takeoff time may be adjusted to make good the ARCT. Notify C2 agency prior to takeoff to adjust the scheduled takeoff time.

6.31.2. Early Departures:

6.31.2.1. Home Station. Early departures are authorized to prevent a delay due to weather, ATC restrictions, airfield or aircraft operational limitations, to adjust mission flow during a large scale operation, or if approved through the C2 center.

6.31.2.2. En route Stations. Early departures at en route stations may be authorized through the C2 center, provided the impact on local and downrange facilities and crew duty is evaluated.

6.32. Weather Minimums for Takeoff use Table 6.1.

Table 6.1. Weather Minimums for Takeoff.

Mission	Visibility	Remarks
Operational	RVR 1000	When less than RVR 1600, but equal to or greater than RVR 1000, the crew may take off if mission priority dictates, provided the runway has dual RVR readouts and displays (minimum RVR 1000 on both) and runway centerline lighting is operational. If the previous conditions cannot be satisfied but visibility is at or above 1000 RVR, the agency responsible for mission execution may authorize takeoff when mission priority dictates. For any takeoff below 1600 RVR, the crew must be fully qualified.
All others	RVR 1600	For runways with more than one operating RVR readout, RVR must read 1600 minimum on all.

NOTES:

If no RVR readout is available for the departure runway, visibility must be reported to be 1/2 mile (800 meters).

When weather is below approach and landing minimums (ceiling or visibility) a takeoff alternate is required (See paragraph **6.19.**)

Section 6E—En route

6.33. Flight Progress.

6.33.1. Prior to flight, plot the oceanic portion of the flight on an appropriate chart. Annotate the chart with the mission number, AC's name, preparer's name, and date. If practical, chart may be reused.

6.33.2. Anytime waypoint data is inserted into the INS (FMS for Pacer CRAG), it will be verified by two primary crewmembers. Check both the coordinate information and the distances between waypoints against the flight plan.

6.33.3. In-Flight, use all available NAVaids to monitor INS (Navigation Systems for Pacer CRAG) performance. Immediately report malfunctions or any loss of navigation capability, which degrades centerline accuracy to the controlling ARTCC. Use the following procedures for flight progress:

6.33.3.1. Obtain a coast out fix prior to, or immediately on entering the Category I Route or over-water segment. Perform a gross error check using available NAVAIDs and annotate the position and time on the chart.

6.33.3.2. When approaching each waypoint, recheck coordinates for the next waypoint.

6.33.3.3. Approximately 10 minutes after passing each oceanic waypoint, record and plot the aircraft position and time on the chart, and ensure compliance with courses and ETA tolerances.

6.33.3.4. If a revised clearance is received, record and plot the new route of flight on the chart.

6.33.3.5. For Pacer CRAG, periodically check all solution position differentials on the INAV pages.

6.33.3.6. For Pacer CRAG, the pilot flying must have course guidance (other than stickmap) appropriate for the current ATC clearance displayed on an MFD during all phases of flight.

6.33.4. Upon return to home station, turn in the charts (copies if reused) and applicable CFPs to the squadron. Squadrons will retain the charts, CFPs, and associated materials for a minimum of 3 months.

6.33.5. Operations in International/Territorial Airspace. (See FLIP, FCG, AP, and MDS series instruction for further guidance) US military aircraft and DoD personnel entering another nation to conduct US government business therein must have the approval of the foreign government concerned to enter their airspace. Foreign clearances for US international air operations are obtained through US officials known as Defense Attaché Officers (DAOs). Refer to FLIP GP for discussion of international strait passage, archipelagic sea-lane passage, procedures to follow if intercepted, and other foreign sovereignty issues.

6.33.5.1. There are essentially two types of airspace: International airspace and territorial airspace. International airspace includes all airspace seaward of coastal states' territorial seas. Military aircraft operate in such areas free of interference or control by the coastal state. Territorial airspace includes airspace above territorial seas, archipelagic waters, inland waters, and land territory and is sovereign airspace. Overflight may be conducted in such areas only with the consent of the sovereign country.

6.33.5.2. Consistent with international law, the US recognizes sea claims up to 12 nautical miles. Diplomatic constraints and/or a lack of diplomatic clearances usually result in missions operating in international airspace. Because of this, it is imperative sufficient information be provided far enough in advance to allow compliance with FCG requirements established by the countries concerned. The US does not normally recognize territorial claims beyond 12 nautical miles; however, specific guidance from certain US authorities may establish limits, which differ from the standard.

6.33.5.3. Flight Information Region (FIR). A FIR is defined as an area of airspace within which flight information and related services are provided. A FIR does not reflect international borders or sovereign airspace. Aircraft may operate within an established FIR without approval of the adjacent country, provided the aircraft commander avoids flight in sovereign airspace.

6.33.5.4. Aircrews on a flight plan route that takes them from international airspace into territorial airspace for which approved aircraft clearances were obtained should not amend entry point(s).

6.33.5.5. Violations of foreign sovereignty result from unauthorized or improper entry or departure of aircraft. Aircrews should not enter into territorial airspace for which a clearance has not been duly requested and granted through diplomatic channels. Refer to GP, paragraph 7-13, for discussion of international strait passage, archipelagic sea-lane passage, procedures to follow if intercepted, and other foreign sovereignty issues.

6.33.5.6. Air traffic control agencies are not vested with authority to grant diplomatic clearances for penetration of sovereign airspace where prior clearance is required from the respective country. Aircraft clearances are obtained through diplomatic channels only.

6.33.5.7. In the event air traffic control agencies challenge the validity of a flight routing or attempt to negate existing clearances, pilots must evaluate the circumstances. The normal response will be to attempt to advise the air traffic control agency that the aircraft will continue to planned destination as cleared in international airspace. The key phrase is "in international airspace." Safety of flight is paramount in determining mission continuation. Under <u>no</u> circumstances should aircrews construe a clearance, which routes their mission over sovereign airspace that was <u>not</u> approved through diplomatic channels prior to mission departure, as being valid authorization.

6.33.5.8. Aircrews operating missions requiring unique or specially developed routing will normally be briefed at home station, onload station, and/or by the last C2 facility transited prior to performing the critical portion of the mission.

6.33.5.9. Aircrews (except on weather reconnaissance missions) normally are not tasked to and should not fly "due regard" routing unless specifically directed in the mission frag or coordinated with proper authorities through TACC or AMOCC. The "due regard" or "operational" option obligates the military aircraft commander to be their own air traffic control agency and separate their aircraft from all other air traffic. If operational requirements dictate, ACs may exercise the "due

regard" option to protect their aircraft. When the threat has terminated, the aircraft will return to normal Air Traffic Services. Refer to FLIP GP for guidance on due regard.

6.33.6. Altitude Reservations. (Source document is FAA Order 7610.4, *Special Military Operations*.) Aircraft commanders will ensure ALTRV approval is received prior to mission execution. Aircrews needing to check the status of their ALTRV may contact TACC East/West cell (24 hours) or XOPSA (normal duty hours).

6.33.6.1. ALTRVs usually include a 1 hour AVANA (ALTRV Approval Void if Aircraft Not Airborne) to account for delays. If a mission delays more than 1 hour, coordination with the appropriate central altitude reservation facility will be required. It may be possible to extend the AVANA time. If not, a new ALTRV will be required. Begin coordination as soon as the delay is known.

6.33.6.2. Requests for ALTRVs do not eliminate the responsibility to obtain diplomatic clearance or file flight plans. The complete route of flight must be included in DD Form 1801, DD Form 175, or other equivalent host nation flight plan.

6.34. Navigational Aid Capability.

6.34.1. North Atlantic minimum navigation performance specification (MNPS) airspace and US West Coast and Hawaii route system procedures are as follows:

6.34.1.1. Minimum navigation performance specification standards (FLIP AP/2) are mandatory.

6.34.1.2. Dual INS aircraft with a qualified navigator that lose one INS prior to airspace entry may continue.

6.34.1.3. Prior to airspace entry, aircrews will return to the nearest maintenance repair facility unless the aircraft has as a minimum: operable dual INS or a qualified navigator with an operable single INS.

6.34.2. Reduced Vertical Separation Minimum (RVSM) Airspace. Airspace where RVSM is applied is considered special qualification airspace. C/KC-135 aircraft (without RVSM modification) do not meet RVSM requirements and will not operate in RVSM airspace.

6.34.3. Pacer CRAG aircraft, the INU/GPS navigation solution can not be used during oceanic navigation for steering unless the GPS is updated to include RAIM capability.

6.34.4. Required Navigation Performance (RNP) Airspace. Airspace where RNP is applied is considered special qualification airspace. Both the operator and the specific aircraft type must be approved for operations in these areas. RNP airspace is being incorporated around the world to increase air traffic capacity by decreasing separation requirements between routes. The C/KC-135 is approved for RNP, but limited to operational time restrictions based on navigation equipment.

6.34.4.1. RNP-10. Compliance includes navigation accuracy within 10NM of actual position 95% of the time. Aircraft not possessing integrated GPS with receiver autonomous integrity monitoring (RAIM), or equivalent system, are limited in how long they may operate in RNP-10 airspace. See FLIP for RPN-10 long term requirements/aircraft capabilities. The C/KC-135 (includes Pacer CRAG) may operate up to 8 hours (after entering nav mode) within RNP-10 airspace. If an automatic update is made, the aircraft may continue for an additional 7.5 hours after

update is complete. If a manual update is made, the aircraft may continue for an additional 7.0 hours after update is complete. The following are RNP-10 requirements:

6.34.4.1.1. To increase the 8.0-hour baseline, data collections on long overwater legs must still be accomplished and submitted to HQ AMC/XPY.

6.34.4.1.2. Flight Planning. Verify aircraft is approved for RNP operation, access mission impact and verify the letter "R" is annotated in block 10 of the DD Form 1801, **International Flight Plan.**

6.34.4.1.3. Enroute. At least two long-range navigation systems certified for RNP-10 must be operational at the oceanic entry point. Periodic crosschecks will be accomplished to identify navigation errors and prevent inadvertent deviation from ATC cleared routes. Advise ATC of the deterioration or failure of navigation equipment below navigation performance requirements and coordinate appropriate actions.

6.34.4.1.4. Document (in the aircraft forms) malfunctions or failures of RNP required equipment, including the failure of this equipment to meet RNP tolerances.

6.34.5. Basic Area Navigation (BRNAV) Airspace. Airspace where BRNAV is applied is considered special qualification airspace. Both the operator and the specific aircraft type must be approved for operations in these areas. BRNAV navigation accuracy criteria is RNP-5. The C/KC-135 is approved for BRNAV operations. Aircraft with integrated GPS have no BRNAV restrictions. Without GPS, aircraft must auto update every two hours (as required) to maintain actual centerline within +/- 5 NM of ATC cleared route.

6.34.5.1. Minimum equipment to operate in BRNAV airspace is one INS capable of updates or an FAA approved GPS with RAIM or equivalent system. Flights entering BRNAV airspace after long overwater flight must be especially aware of BRNAV tolerances and update accordingly.

6.34.5.2. Aircraft unable to maintain BRNAV tolerances must advise ATC immediately and take appropriate coordinated action.

6.34.5.3. Document (in the aircraft forms) malfunctions or failures of BRNAV required equipment, including the failure of this equipment to meet BRNAV tolerances.

6.35. CIRVIS and Other Reports. Report all vital intelligence sightings from aircraft as indicated in FLIP planning or FLIP En route Supplement.

6.35.1. In-Flight harassment or hostile action against C/KC-135 aircraft. Aircraft subjected to harassment or hostile action by foreign aircraft will immediately contact the nearest US Air Force air and ground voice facility and report the encounter. Include aircraft nationality, type, insignia, or any other identifying features; note position, heading, time, speed when harassed, and the type of harassment. Request relay of the report to the nearest C2 center. Also attempt to contact the nearest command post when in UHF and VHF range.

6.35.2. Other incidents will be reported as indicated in JCS Pub 6, volume V and AFM 10-206, *Operational Reporting.*

6.36. In-Flight Meals. The AC and the pilot should not eat meals at the same time, and their meals should consist of different menu items.

6.37. Communications.

6.37.1. HF Communications. Confine message traffic to essential operational matters. Perform a HF radio ground check prior to takeoff when the use of HF radio may be required for ATC or C2 communications. Establish HF contact before going out of UHF and VHF range. If unable to establish HF contact with the controlling HF station and an alternate means of relay of ATC information in oceanic areas is not available, return to the nearest suitable support base.

6.37.2. General. Provide ARTCC position and weather observations when required. If unable to contact an ATC agency, attempt relay through the GLOBAL HF stations.

6.37.3. AF Form 72 **Air Report (AIREP)**. When directed by departing weather facility, take and record an AIREP at each position report over a Category I Route. Identify inaccurate CFP winds by special report if the average wind for a route segment exceeds either 30 degrees error in wind direction or 25 knots in wind speed. Turn in completed AF Form 72 to the destination USAF weather facility.

6.38. In-Flight Emergency Procedures. Report deviations from directives that may occur as a result of an emergency in accordance with AFI 11-202, Volume 3 and this instruction.

6.38.1. Notification of Controlling Agencies. When practical after completing the aircraft emergency action checklists and associated actions crews should furnish the controlling agency and appropriate C2 center a description of the difficulty, assistance required, intentions, and any other pertinent information.

6.38.2. A CONFERENCE SKYHOOK may be initiated when additional expertise is necessary to cope with emergencies or other conditions. Communications procedures are as follow:

6.38.2.1. Local Area. When in UHF or VHF range, initiate the conference over appropriate frequencies.

6.38.2.2. En route. When out of UHF range, use HF radios to establish a phone patch with the nearest or controlling C2 center as appropriate.

6.38.2.3. Provide the following information when time permits.

6.38.2.3.1. Narrative description of the situation to include actions taken by the crew and the intentions of the AC.

6.38.2.3.2. Fuel on board and hours of endurance.

6.38.2.3.3. Position.

6.38.2.3.4. Altitude and flight conditions.

6.38.2.3.5. Number of personnel and distinguished visitors (DV) on board.

6.38.2.3.6. Qualification of AC (instructor, evaluator, etc.)

6.38.2.3.7. Planned landing base.

6.38.2.3.8. ETA at landing base.

6.39. Need for Medical Assistance. When a person aboard the aircraft requires medical care, inform the station of intended landing in sufficient time so medical personnel may meet the aircraft. Include the sex, approximate age, and the major complaint in the request.

6.40. Weather Forecasts.

6.40.1. It is the pilot's responsibility to obtain destination weather prior to descent.

6.40.2. The primary means is any US Air Force base weather station via pilot-to-meteorologist service (PMSV) or through a US Air Force aeronautical station.

6.40.3. For aircraft flying in EUCOM AOR (ENAME operations) contact USAFE/OWS at Sembach AB GE (DSN 314-496-6145) SOUTHCOM AOR contact 25 OWS at Davis-Monthan AFB, AZ (DSN 228-1977).

6.40.4. The ATC system can provide weather information to en route aircraft.

6.40.4.1. The ARTCCs have a limited capability to provide weather information to en route aircraft within CONUS.

6.40.4.2. SIGMET advisories will be transmitted from the servicing ATC unit. Crews will consider all SIGMETs valid for their aircraft until verified as not applicable with a military METRO service.

Section 6F—Arrival

6.41. Descent. Prior to descent into unfamiliar areas, appropriate terrain charts (Operational Navigation Chart (ONC), Sectional Aeronautical Chart, Tactical Pilotage Chart (TPC), or Joint Operations Graphic (JOG)) should be reviewed to increase aircrew situation awareness of obstructions. Primary crewmembers will not be involved in duties other than aircraft operations, descent and approach monitoring, and required checklist items from the initial descent point to landing.

6.41.1. Night and Marginal Weather Operations. Fly a precision approach, if available, at night or during marginal weather. If a precision approach is not available, fly any available approved instrument approach. During night VFR conditions, if an approved instrument approach is not available, a visual approach may be flown (only if a visual glide slope indicator (VASI, PAPI, etc.) is available). On training and evaluation flights at familiar fields, pilots may fly non-precision approaches or VFR traffic patterns to accomplish required training and evaluations. The pilot not flying the approach will monitor a precision approach when practical to enhance safety.

6.42. Instrument Approach Procedures.

6.42.1. Prior to starting an instrument approach or beginning an en route descent, pilots will confirm that existing weather is reported to be at or above required minimums for the lowest compatible approach. Pilots shall increase the published visibility minimums of an instrument approach by 1/2 SM or as noted in NOTAMs, on ATIS, or on the approach plate, when the runway approach lighting system (ALS) is inoperative. ***NOTE:*** This applies only to the ALS itself, not to VASIs, PAPIs, and other lights that are not a component of the ALS (AFI 11-202, Volume 3, 8.14.2).

6.42.1.1. Prior to starting an instrument approach, pilots will confirm their aircraft can meet or exceed all climb gradients specified in the missed approach procedure, based on the number of engines operating when the approach is begun. If missed approach climb charts are not available, use the takeoff obstacle clearance charts. If unable to meet required climb gradients, pilots must coordinate alternate missed approach procedures with ATC which will ensure terrain clearance, prior to commencing the approach. If this is not possible, do not attempt the approach.

6.42.1.2. For a precision approach, the decision height will provide a height above touchdown of 200 ft or higher. For PAR approaches, visibility will be no lower than RVR 2400 (730 meters) or 1/2 mile visibility (800 meters) with no RVR readout available.

6.42.1.3. When circling minimums are published, but not by category, circling approach minimums will be as published, but in no case lower than a ceiling of 600 feet and 2 miles visibility.

6.42.1.4. UHF NDB approaches will not be flown in C/KC-135 aircraft.

6.42.2. Established on a Segment of the Approach. If established on a segment of the approach or being radar vectored to final approach and the weather is reported or observed to be below approach minimums, AC has the option of continuing the approach to the MAP/DH. If deciding to abandon the approach, level off (or descend if a lower altitude is required for the missed approach procedure). Comply with the last assigned clearance until a new or amended clearance is received.

6.42.2.1. Do not continue the approach below minimums unless the aircraft is in a position to make a safe landing and the runway environment is in sight.

6.42.2.2. If the approach is continued, the AC must plan to have sufficient fuel available to complete the approach and missed approach and proceed to a suitable alternate with normal fuel reserve.

6.42.2.3. The AC has final responsibility for determining when the destination is below designated minimums and for initiating proper clearance request.

6.42.3. Alternate Flight Publications. The following publications are authorized if acceptable DoD FLIP products are not available:

6.42.3.1. United States Department of Commerce National Oceanic and Atmospheric Administration (NOAA).

6.42.3.2. Jeppesen and Host Government Instrument Approaches. May be used if MAJCOM approved IAW AFI 11-202, Volume 3. Crews will contact the controlling agency to confirm MAJCOM approval prior to flying these approaches. If not MAJCOM approved, these approaches may not be used.

6.43. Classified Equipment and Material.

6.43.1. Equipment. When classified equipment is onboard, ensure the C2 center or base operations office is aware of the requirement for aircraft security according to **Chapter 7** of this AFI. At bases not under jurisdiction of the Air Force, ensure the aircraft and equipment are protected. AFI 31-401, *Managing the Information Security Program*, provides specific guidance concerning the security of various levels of classified equipment aboard aircraft.

6.43.2. Material. Ensure Communications Security (COMSEC) and other classified materials are turned in at destination and receipts are obtained for COMSEC and classified material. The On-site C2 center will provide temporary storage for COMSEC and other classified materials during en route, turnaround, and crew rest stops. If a storage facility is not available, the aircraft gun storage box may be used for material classified up to and including SECRET. Encrypted COMSEC will only be transferred to authorized DoD personnel.

6.43.3. Aircrews will ensure that they have an operable mode 4 when required for mission accomplishment. Aircrews will conduct an operational ground test of the mode 4 (ground test assets permit-

ting) prior to deployment overseas, or as specified in the OPORD or contingency/exercise tasking. PACAF and USAFE units will comply with MAJCOM guidance.

6.43.4. Attempt to fix an inoperable mode 4 prior to takeoff. Do not delay takeoff nor cancel a mission for an inoperable mode 4, except when the aircraft will transit an area where safe passage procedures are implemented.

6.43.5. Conduct an in-flight check of the mode 4 on all missions departing the CONUS for overseas locations. Aircrews can request the mode 4 interrogation check through NORAD on UHF frequency 364.2.

6.43.6. Aircraft with inoperable mode 4 will continue to their intended destinations. Repairs will be accomplished at the first destination where equipment, parts, and maintenance technicians are available. In theaters where safe passage is implemented, aircraft will follow procedures for inoperable mode 4 as directed in the applicable airspace control order or ATO.

6.43.7. Ground and in-flight checks of the mode 4, when conducted, are mandatory maintenance debrief items. Crews will annotate successful and unsuccessful interrogation of the mode 4 on all aircraft forms (AFTO Form 781A).

6.43.8. Aircrews will carry COMSEC equipment and documents required to operate the mode 4 on missions when required per paragraph **6.43.3.** Prior to departing for any destination that is without COMSEC storage facilities, crews will contact their local COMSEC managers for guidance.

6.44. Unscheduled Landings . When an unscheduled landing or crew rest occurs at a base without a passenger facility, the AC should immediately advise the appropriate C2 center and request assistance in arranging substitute airlift for passengers that are aboard. The following procedures apply when obtaining support for service members, in a group travel status, who are transported on AMC organic aircraft flying a TWCF mission which incur an unscheduled delay due to weather or maintenance problems, forcing the members to be lodged at that location until the aircraft can continue its mission.

6.44.1. If the delay is at a location where DoD facilities and AMC TWCF funds are available, payment for lodging (contract or on base) will be made by the local accounting liaison/OPLOC citing TWCF funds. The appropriate TWCF funds cite may be obtained from the local financial analysis and/or accounting liaison office. Normally, a BPA contract or AF Form 616 is already established at these locations to charge the routine lodging costs for transient or TDY individuals who are on TWCF funded travel orders.

6.44.2. If the delay is at a location where DoD facilities are available and AMC TWCF funds are not available, the AC will utilize AF Form 15 authority to acquire the appropriate lodging accommodations. Upon return to home station, the AC will turn in the AF Form 15 to the local accounting liaison office. A copy of the service members' group travel orders, along with any other pertinent supporting data, must accompany the form (e.g., lodging invoice and/or receipts). When the AF Form 15 has been validated, it will be forwarded on to the servicing OPLOC for payment, citing the funds of the unit whose aircraft was delayed.

6.44.3. If the delay is at a location where both DoD facilities and TWCF funds are unavailable, the AC will utilize AF Form 15 authority to acquire the appropriate meals, quarters, and transportation to support the service members. Upon return to home station, the AC will turn in the AF Form 15 to the local accounting liaison office. A copy of the service members' group travel orders, along with any other pertinent supporting data, must accompany the form (e.g., lodging invoice and/or receipts).

When the AF Form 15 has been validated, it will be forwarded on to the servicing OPLOC for payment, citing the funds of the unit whose aircraft was delayed.

NOTE: This policy does not apply to those passengers on delayed TWCF organic aircraft who are in a per diem or space available status except for those duty passengers on TWCF funded travel orders delayed at locations where TWCF funds are available.

6.45. Maintenance. Complete the AFTO Form 781 after each flight. After landing, crewmembers debrief maintenance personnel on the condition of the aircraft, engines, avionics equipment, and all installed special equipment as required. At stations without maintenance support, when a maintenance requirement exists the AC will ensure a thorough debrief is provided to the C2 agency, and the MAJCOM Logistics Readiness Center is notified prior to entering crew rest.

6.46. Border Clearance.

6.46.1. Normal Operations:

6.46.1.1. The unit dispatching the mission is normally responsible for the border clearance of all aircraft.

6.46.1.2. When staff support is not available, border clearance is the responsibility of the AC. Duties may be assigned to ground personnel or to the boom operator, but the AC retains ultimate responsibility. When a C/KC-135 aircraft is on-loaded at a base without an air traffic function, the AC is responsible for ensuring the following:

6.46.1.2.1. Crewmembers, troops, and passengers possess current passports and valid visas, when required.

6.46.1.2.2. Crewmembers, troops, and passengers have current certificates of immunization (shot record).

6.46.1.2.3. Cargo entry documents are in proper order.

6.46.1.2.4. Departing or entering the United States through an air base where border clearance can be obtained.

6.46.1.2.5. Obtaining border clearance for aircraft cargo, passengers, crew and baggage, if required, before takeoff to a foreign area or after arrival from a foreign area.

6.46.1.2.6. Spraying the aircraft (FCG and paragraph **6.47.** of this chapter).

6.46.2. Procedures for US Entry:

6.46.2.1. En route, the boom operator will distribute personal customs declarations (when not accomplished by passenger services) to all passengers, troops, and crewmembers. The boom operator will also brief passengers and crewmembers on customs regulations, and prepare and compile necessary border clearance forms for the AC's signature.

6.46.2.2. En route, notify the CC agency at the base of intended landing of any change in ETA to ensure that border clearance is accomplished as soon as possible after landing.

6.46.2.3. Obtain a permit to proceed when military necessities require that an aircraft (which has landed in the United States for customs clearance) proceed to another base in the US to obtain border clearance. The permit to proceed delays customs inspection of cargo, passengers, and crew

until arrival at the off-load station and saves intermediate off-loading and reloading normally required for customs inspection. The permit to proceed is valid only to the airport of next landing where the border clearance must be completed or a new permit to proceed issued by a customs official. Do not make intermediate stops between the issue point of the permit to proceed and destination of manifested cargo unless required by an emergency situation or directed by the C2 center.

6.46.2.4. When an aircraft lands for a US border clearance, a US Customs representative normally will meet the aircraft to obtain the required documents. Do not deplane passengers, troops, or crewmembers unless necessary for safety or the preservation of life and property (crew chief excepted). Do not unload until approved by customs and agriculture personnel or their designated representatives. This procedure applies to the initial landing in the US and all landings required when operating on a permit to proceed or until all crew, passengers, and cargo complete final border clearance.

6.46.2.5. If the aircraft lands for emergency or temporary reasons, the AC will ensure no cargo, baggage, personal property, or equipment is removed from the aircraft. Additionally, no passengers or crewmembers will depart the landing place unless removal or departure is necessary for safety or preservation of life and property.

6.46.3. Inspections of US aircraft by foreign officials:

6.46.3.1. Follow US Air Force policy on status of military aircraft as stated in the FCG, General Information, chapter 3. In substance, this policy holds that US military aircraft are immune from searches, seizures, and inspections (including customs and safety inspections) by foreign officials. In addition, ACs must be aware of and adhere to any specific FCG provisions for individual countries.

6.46.3.2. If confronted with a search request by foreign authorities, aircrews should use the following procedures:

6.46.3.2.1. In most cases, search attempts may be halted simply by a statement of the AC to the foreign official that the aircraft is a sovereign instrumentality not subject to search without consent of US Air Force headquarters or the US Department of State officials in the country concerned. This should be clearly conveyed in a polite manner so as not to offend foreign authorities that may honestly, but mistakenly, believe they have authority to search US Air Force aircraft.

6.46.3.2.2. If foreign authorities insist on conducting a search, the AC should make every effort to delay the search until he or she can contact US Air Force headquarters or the appropriate embassy officials. The AC should then notify these agencies of foreign request by the most expeditious means available and follow their instructions.

6.46.3.2.3. If foreign officials refuse to desist in their search request, pending notification to US Air Force headquarters or the appropriate embassy, the AC should indicate that they would prefer to fly the aircraft elsewhere (provided fuel, flying time, and mechanical considerations permit a safe flight) and request permission to do so.

6.46.3.2.4. If permission is refused and the foreign authorities insist on forcing their way on board an aircraft, the AC should state that he protests the course of action being pursued and that he intends to notify both US Air Force headquarters and the appropriate American

embassy of the foreign action. The AC should not attempt physical resistance, and should thereafter report the incident to US Air Force headquarters and appropriate embassy as soon as possible. The AC should escort foreign authorities if the inspection cannot be avoided.

6.46.3.3. Other procedures may apply when carrying sensitive cargo or equipment. Follow these procedures and applicable portions of classified Foreign Clearance Guide supplements.

6.47. Insect and Pest Control.

6.47.1. Responsibility. ACs will ensure required spraying is accomplished according to AFJI 48-104, *Quarantine Regulations of the Armed Forces,* DoD FCG, or as directed by higher headquarters. Certify the spraying on Customs Form 7507, or on forms provided by the country transited. **Aircraft should never be sprayed with passengers on-board**. The only exception is when the FCG mandates it.

6.47.1.1. When spraying is required, use insecticide, aerosol d-phenothrin-2 percent, National Stock Number (NSN) 6840-01-067-6674 (or equivalent), to spray the aircraft.

6.47.1.1.1. Direct the nozzle toward the ceiling of the compartment or space being sprayed.

6.47.1.1.2. Spray spaces inaccessible from within the aircraft after completely loading fuel, baggage, cargo, and passengers, including baggage compartments, wheel wells, and other similar spaces.

6.47.1.1.3. Spray the cabin, cockpit, and other spaces accessible from within the aircraft after the crew is aboard and after closing all doors, windows, hatches, and ventilation openings.

CAUTION: If the insecticide label directs disembarkation after use, spray prior to boarding crew or passengers. Close all doors and hatches for 10 minutes after dispensing and ventilate for 15 minutes before allowing anyone on board.

6.47.1.2. Spray for 3 minutes and 25 seconds unless longer periods are specified for the country being transited.

NOTE: Keep used aerosol cans separate from other trash so they may be disposed of safely.

6.47.2. Responsibility of Aircraft Commander in-flight. When seeing any insect or rodent infestation of the aircraft in-flight, notify the destination C2 center, base operations, or airport manager of the situation before landing so the proper authorities can meet the aircraft.

6.47.3. Procedure at Aerial Port of Disembarkation (APOD). On arrival at an APOD, do not open cargo doors or hatches except to enplane officials required to inspect the aircraft for insect or rodent infestation or to deplane the minimum number of crewmembers required for block-in duties. Do not on-load or off-load cargo or passengers until the inspection is satisfactorily completed. This procedure may be altered to satisfy mission or local requirements, as arranged by the base air terminal manager or the local C2 organization.

Section 6G—Miscellaneous.

6.48. Dropped Object Prevention. If an externally dropped object is discovered, the flight crew will: (1) Notify TACC or MAJCOM controlling agencies as soon as practical; include routing, altitude, weather, etc., and (2) Notify maintenance at the available station transited.

6.49. Not Used.

6.50. Life Support and Dash 21 Equipment Documentation. The AC or designated representative will:

6.50.1. Prior to departing home station or en route stations, ensure appropriate serviceable protective clothing, life support, survival, and dash 21 equipment for the entire or remainder of the mission are aboard the aircraft.

6.50.2. Prior to departing home station and following en route crew changes, review AF Form 4076, **Aircraft Dash 21 Equipment Inventory**, to ensure all required dash 21 equipment has been certified as installed by maintenance, the initial check has been signed by maintenance, and configuration documents match mission requirements.

6.50.3. Prior to departing home station and following en route crew changes, review, sign, and date the AFTO Form 46, **Pre-positioned Life Support Equipment**, to ensure all required protective clothing and life support and survival equipment have been certified as installed by aircrew life support and that configuration documents match mission requirements. Ensure appropriate number and type of life preservers are aboard for over-water missions carrying children and infants.

6.50.4. Missing Equipment. Aircrew members discovering equipment missing will accomplish the following:

6.50.4.1. Make an AFTO Form 781 entry for equipment found missing. Additionally, ensure equipment removed from the aircraft at an en route station is documented in the AFTO Form 781.

6.50.4.2. Annotate AF Form 4076 and AFTO Form 46 in the next vacant column indicating the quantity remaining for the item. Ensure the ICAO location designator is entered above the check number of that column. Leave AF Form 4076 and AFTO Form 46 on board the aircraft in the event of an en route crew change.

6.50.4.3. Advise the AC and determine whether the missing equipment should be recovered or replaced before mission continuation.

6.50.4.4. Assist, as required, in preparing reports of survey for missing equipment.

6.50.4.5. When possible, advise MAJCOM and TACC (or airport management) before mission continuation.

6.50.5. Additional Equipment. If more equipment is discovered during the preflight than is annotated on AF Form 4076 and AFTO Form 46, annotate the total quantity in the next vacant column for the item. Ensure the ICAO location designator is entered above the check number of that column.

6.51. Cockpit Voice Recorder (CVR). To prevent the recording of sensitive information on the CVR, anytime classified conversations may occur in the cockpit (SIOP alert, special operations mission, etc.) the CVR circuit breakers must be pulled and collared. It is not sufficient to “CLEAR” the CVR, since classified information might still be extracted from the CVR , even after it has been cleared.

6.52. Not used.

6.53. No Show Passenger Baggage. No-show passenger baggage or baggage of passengers removed from flight will be downloaded prior to departure.

6.54. Airfield Data Reports. Aircrews transiting strange airfields or airfields where conditions may adversely affect subsequent flight will:

6.54.1. Report airfield characteristics that produce illusions, such as runway length, width, slope, and lighting, as compared to standard runways, sloping approach terrain, runway contrast against surrounding terrain, haze, glare, etc.

6.54.2. Debrief the next C2 center transited.

6.55. Impoundment of Aircraft. If an aircraft is involved in a serious in-flight incident, the AC should impound the aircraft immediately after landing and contact the controlling C2 center for further instructions.

Section 6H—Pacer CRAG Procedures.

6.56. KC-135 Aircraft Modified by TCTO-1433 (Pacer CRAG). These aircraft have had extensive avionics upgrades, which allow operations with either a 3-Person or 4-Person crew. Pacer CRAG C/KC-135 aircraft will normally be operated using 3-Person procedures. When operating using 4-Person procedures, the navigator's role is to provide added combat capability by reducing individual crewmember workloads and thus lowering the possibility that the crew will become task saturated during any part of the mission. Most day-to-day missions will not necessitate 4-Person operations. Commanders may designate that any mission use 4-Person procedures if the complexity or priority dictates, or if navigator currency/training requires. When a mission is scheduled as 4-Person, Pacer CRAG equipment (MFD, CDU, and MFD and Radar Control panels) must be installed at the navigator station.

6.57. General Pacer CRAG Procedures.

6.57.1. Mission Planning. The aircrew or an appropriate staff planning agency will complete a mission flight plan in accordance with the flight manual and associated directives anytime a scheduled mission departs the local traffic pattern. If prepared by staff, the aircrew is responsible to review and ensure the accuracy of the plan and other materials. See paragraph **6.15.6.** regarding FMS DAFIF data currency.

6.57.1.1. Mission Flight Plans. Mission flight plans will normally be completed using MAJCOM approved software. For fuel conservation, plan missions in accordance with paragraphs **5.17.** and **6.22.** of this instruction.

6.57.1.2. Air Refueling. Circumstances permitting, tanker aircrew(s) should coordinate with either the receiver aircrew(s) or the receiver's scheduling unit prior to departure to ensure air refueling information accuracy.

6.57.1.3. Navigation Charts. The route of flight must be depicted on an appropriate navigation chart in accordance with the flight manual and associated directives. Ensure that restricted, warning, or prohibited airspace is annotated on the chart if the special-use airspace is in the planned altitude structure and within 50 NM of the intended route-of-flight. For all flights conducted off airways, which penetrate the Air Defense Identification Zone (ADIZ) on the inbound leg, also annotate the ADIZ on the chart.

6.57.2. Navigation Incident Report, Navigation incident reporting procedures, including confirmed (i.e. voice communications by air traffic control (ATC) agency) or suspect are in **Chapter 9** of this

AFI. MAJCOMs will investigate navigation incident reports and violations according to AFI 11-202 Volume 3, *General Flight Rules*, and AFI 90-301, *Inspector General Complaints*.

6.57.3. Departure and Arrival Procedures.

6.57.3.1. Predictive Wind Shear. See paragraph **6.21.11.**

6.57.3.2. For all takeoff, approaches, and landings the Pilot Flying (PF) must have the top MFD set with the full ADI, and course guidance (other than stickmap) appropriate for the current ATC clearance, displayed on an MFD. **EXCEPTION:** When malfunctions limit the pilot to a single operable MFD.

6.57.4. Enroute Procedures.

6.57.4.1. The maximum extent possible, Pacer CRAG aircraft will be flown with the autopilot coupled to the FMS (except for takeoffs, air refuelings, uncoupled approaches, and landings). This reduces aircrew workload (particularly during air refueling rendezvous) and increases adherence to the ATC clearances.

6.57.4.2. Air Traffic Rules. Unless authorized by the controlling agency, aircraft operating in controlled airspace under IFR on all routes, published or unpublished, must fly along a direct course between NAVAIDs or fixes defining the route. Deviations will only be approved by the controlling agency or when operating in special-use-airspace or on Military Training Routes (MTRs). See chapter 6 of FLIP General Planning, the Foreign Clearance Guide, FAA Handbook 7610.4H, and AFI 11-202, Volume 3, for additional requirements or restrictions.

6.57.4.3. High Latitude Navigation. GRID heading reference at high latitude will normally be limited to when the receiver requires grid reference for the rendezvous and air refueling. True heading reference may be used to minimize the rapid change of magnetic heading while flying a constant course. Since the two primary (INU) heading inputs are based on FMS variation applied to true heading, magnetic reference could also be used at high latitudes with no loss in navigation performance.

6.57.4.4. Cell Formation Navigation. Cell lead is responsible for the navigation of the entire cell. The primary responsibility of cell aircraft is station-keeping, however they must be prepared to assume lead navigation, if required.

6.57.5. Weather Radar Usage. Configure the weather radar based on mission requirements. Continuous care must be exercised to not configure the weather radar to simultaneously operate in an excessive number of modes (i.e. PWS active, sweep sharing, weather/skin paint overlay, and automatic volumetric scanning) since this will significantly degrade normal radar performance in each individual mode.

6.57.6. Minimum Navigation Performance Specification (MNPS) Operations. Operations within the North Atlantic area's MNPS airspace, Canadian MNPS, or selected Pacific routes are designed for INS-autopilot coupled operation. (See FLIP AP/2, chapter 5, and AFI 11-202, Volume 3.) When not engaged in A/R operations, aircrews will adhere to these procedures.

NOTE: MNPS navigation accuracy standard is 6.3 NMs along two designated geographic coordinates for a significant percentage of the mission flown on the route. Aircraft exceeding the maximum value of 24 NMs is considered "gross navigation."

6.57.6.1. The Pacer CRAG C/KC-135 has three different navigation systems (INU-1 (Embedded GPS-INU--EGI), INU-2 (Delco Carrousel IV INU), and GPS) which provide five navigation solutions (INU1/GPS, INU2/GPS, INU1 Only, INU2 Only, and GPS Only). The INU/GPS navigation solution cannot be used during oceanic navigation for steering unless the GPS includes RAIM. These systems meet MNPS accuracy requirements, but not GATM requirements. Navigation responsibility should focus on the successful operation, routine monitoring, validation, and accurate update of the navigation systems. Malfunctioning equipment that reduces the aircrew's capability to comply with MNPS, whether occurring prior to or within MNPS airspace, will be immediately reported to the controlling agency and subsequent agencies throughout the route of flight. Prior to airspace entry, aircrews will return to the nearest maintenance repair facility unless the aircraft has as a minimum of two operable INUs, or a qualified navigator with a single operable INU.

6.57.6.2. When flying in MNPS airspace, exercise special caution to ensure the coordinates of the assigned track and associated landfall and domestic routings are fully understood and correctly inserted into the FMS with appropriate cross-checks. If at any time the route (re-routing, if appropriate) is in doubt, check the details with ARTCC facility.

6.57.6.3. Inoperative Navigation Systems (Oceanic systems include: INU-1, INU-2, and GPS with RAIM).

6.57.6.3.1. One unit inoperative:

Advise ARTCC unless within range of normal radio aids.

Plot position on navigation chart every 30 minutes.

Check the accuracy of remaining nav systems, using all available NAVAIDs.

6.57.6.3.2. Two units inoperative:

Advise ARTCC.

Cross-check compass system heading with mission plan at each waypoint or every 30 minutes.

Verify last recorded position on chart.

Use flight plan as guide.

Use ADF, VOR/DME, weather radar ground mapping mode, to update estimated positions.

If desired and other methods fail, try to obtain an HF DF fix. This service can be requested through the regular ARTCC frequencies.

6.57.6.3.3. Differences Between Navigation Systems. When there is a difference between navigation systems, normally two of the three will be in close proximity, so that it will be simple to determine that the malfunctioning system is the one, which is most distant from the other two. When available, check position using available ground NAVAIDs. Comparing the doppler groundspeed with the groundspeed derived from each system may also provide a good indication of a malfunctioning system.

6.58. Pacer CRAG 3-Person Operations.

6.58.1. Concept. Pacer CRAG C/KC-135 aircraft will normally be operated using 3-person procedures. The boom operator forward position should be as far forward as possible, either the navigator

or crew instructor (jump) seat. Crew responsibilities which differ from those listed below will be thoroughly reviewed during the AC briefing.

6.58.2. Pilot Flying (PF) Pacer CRAG 3-Person Responsibilities.

Accomplish/review mission flight plan and chart (with other pilot(s)).

During mission planning, manually compute a rendezvous turn range and offset when a point parallel rendezvous is scheduled/anticipated (with other pilot(s)).

Monitors/communicates on C2 frequency when BO is unable.

Monitors/communicates on air refueling frequency down to approximately ½ mile, or when BO has receiver(s) visually.

Backs up PNF's FMS navigation.

6.58.3. Pilot Not Flying (PNF) Pacer CRAG 3-Person Responsibilities.

Accomplish/review mission flight plan and chart (with other pilot(s)).

During mission planning, manually compute a rendezvous turn range and offset when a point parallel rendezvous is scheduled/anticipated (with other pilot(s)).

Monitors/communicates on ATC frequency.

Operates/monitors weather radar and TCAS. Responsible for weather avoidance.

FMS navigation (DIRECT TOs, Flight Plan Changes, Editing Patterns, etc.).

FMS rendezvous (Activating ORBIT, RDVZ, and TRACK).

Operates FSAS. (Including investigating "Check FSAS").

Monitors systems for problems (Including investigating "Check STATUS," "Check NAV ERR," etc.).

Monitors navigation systems for accuracy.

Updates FMS "BAROSET," as required.

6.58.4. Boom Operator (BO) Pacer CRAG 3-Person Responsibilities.

Loads GPS, mode 4, and secure voice keys, as required.

Monitors/communicates on C2 frequency, except when duties require absence from crew compartment.

Operates nav station equipment (altimeter, APN-69 beacon, ASQ-15 radar pressurization, etc.).

Monitors/communicates on air refueling frequency from receiver approximately ½ NM in trail until final disconnect.

Computes V_{MGS} prior to first approach (if required).

Backs up pilots on all altitude clearances.

Backs up pilots on briefed approach procedures.

6.59. Pacer CRAG 4-Person Operations.

6.59.1. Concept. Pacer CRAG C/KC-135 aircraft will normally be operated using 3-person procedures. When operating using 4-person procedures, the navigator's role is to provide added combat capability by reducing individual crewmember workloads and thus lowering the possibility that the crew will become task saturated during any part of the mission. Most day-to-day missions will not necessitate 4-person operations. Commanders may designate that any mission use 4-person procedures if the complexity or priority dictates, or if navigator currency/training requires. Crew responsibilities, which differ from those listed below, will be thoroughly reviewed during the AC briefing.

6.59.2. Pilot Flying (PF) Pacer CRAG 4-Person Responsibilities. Monitors/communicates on air refueling frequency from receiver approximately 3 NM in trail to approximately ½ mile, or when BO has receiver(s) visually.

Backs up Nav's FMS navigation.

6.59.3. Pilot Not Flying (PNF) Pacer CRAG 4-Person Responsibilities.

Monitors/communicates on ATC frequency.

Operates/monitors TCAS.

Operates/monitors weather radar (during takeoff, approaches, and landings, or when "sweep sharing" has been coordinated with Nav).

Operates FSAS. (Including investigating "Check FSAS").

Backs up Nav's FMS navigation.

Backs up Nav's monitoring systems for problems (Investigating "Check STATUS," "Check NAV ERR," etc.).

6.59.4. Navigator (Nav) Pacer CRAG 4-Person Responsibilities.

Accomplish/review mission flight plan and chart.

Monitors/communicates on C2 frequency.

Monitors/communicates on air refueling frequency down to receiver approximately 3 NM in trail.

Loads GPS, mode 4, and secure voice keys, as required.

Operates nav station equipment (altimeter, APN-69 beacon, ASQ-15 radar pressurization, etc.).

Operates/monitors weather radar. Responsible for weather avoidance.

NOTES:

During cell formation (other than lead) the Nav should use the weather radar to monitor formation position as a backup to TCAS, if weather conditions are such that visual contact with the other(s) in the formation may be lost.

FMS navigation (DIRECT TOs, Flight Plan Changes, Editing Patterns, etc.).

FMS rendezvous (Activating ORBIT, RDVZ, and TRACK).

Monitors systems for problems (Including investigating "Check STATUS," "Check NAV ERR," etc.).

Monitors navigation systems for accuracy. The navigator is required to crosscheck navigation systems (all five navigation solutions) for accuracy using, at maximum, approximately 30 minute pacing. First

crosscheck is required within 30 minutes of level off. Crosschecks are not required while practicing approaches, if the FMS is not the primary means of navigation.

Updates FMS "BAROSET," as required.

Computes V_{MGS} prior to first approach (if required).

Backs up pilots on all ATC clearances.

Backs up pilots on terminal and approach procedures.

6.59.5. Boom Operator (BO) Pacer CRAG 4-Person Responsibilities. (Boom Operators need not be Pacer CRAG certified/qualified for 4-person operations, however in these cases another crewmember will point out the location of applicable annunciator lights.)

Monitors/communicates on air refueling frequency from receiver approximately ½ NM in trail until final disconnect.

6.60. MPRS. For MPRS, periodically check Ram Air Turbine (RAT) speeds on appropriate Pod Control Panel(s) for overspeed condition(s).

Chapter 7

AIRCRAFT SECURITY

7.1. General. This chapter provides guidance on aircraft security and preventing and resisting aircraft piracy (hijacking) of C/KC-135 aircraft. AFI 13-207, *Preventing and Resisting Aircraft Piracy (Hijacking),* AFI 31-101, volume 1, *Air Force Physical Security Program,* and specific MAJCOM security publications contain additional guidance. Aircrews will not release information concerning hijacking attempts or identify armed aircrew members or missions to the public.

7.2. Security. The C/KC-135 is normally designated a security priority "C". However it becomes a priority "B" resource when on alert status. Aircraft security at non-US military installations is the responsibility of the AC.

7.3. Air Force Physical Security Program. The following security procedures will implement AFI 31-101, *The Air Force Physical Security Program,* requirements for C/KC-135 aircraft:

7.3.1. When designated priority "C", the aircraft will be parked in an established restricted area and afforded protection via a roving patrol and a two-person armed response capability within 5 minutes.

7.3.2. When designated priority "C", when no permanent or established restricted area parking space is available, establish a temporary restricted area consisting of a raised rope barrier, and post with restricted area signs. Provide a one-person mobile patrol, supported by a two-person security response team capable of 5-minute response. Portable security lighting will be provided during the hours of darkness if sufficient permanent lighting is not available.

7.3.3. At non-United States military installations, the AC determines the adequacy of local security capabilities to provide aircraft security commensurate with this chapter. If he or she determines security to be inadequate, the aircraft will depart to a station where adequate security is available.

7.3.4. The security force must be made aware of all visits to the aircraft.

7.3.5. Security support is a continual requirement and is not negated by the presence of aircrew or ground crewmembers. Security force support terminates only after the aircraft doors are closed and the aircraft taxies.

7.3.6. When designated priority "B," the C/KC-135 may be parked inside a permanent restricted area containing priority "A" or "B" resources with no additional patrol or post required. If parked within an area containing only priority "C" resources or if parked outside a permanent "B" restricted area, an individual resource protection sensor (IRPS) must be installed with the alarm termination at an existing post or patrol. If no IRPS is available, the security force must be able to ensure positive entry control, boundary surveillance over the restricted area or aircraft, and a two-person armed response capability within 5 minutes.

7.4. En Route Security. The planning agency must coordinate with the execution agency to ensure adequate en route security is available. ACs will receive a threat assessment and en route security capability evaluation briefing for areas of intended operation prior to home station departure and should request updates from en route C2 center as required. If required, a PHOENIX RAVEN team will be assigned to the mission for security.

7.4.1. The PHEONIX RAVEN team will consist of two US Air Force security force members, but may include more depending on security requirements. The team travels special passenger status and is responsible to the AC at all times. In turn, ACs are responsible for their welfare (transportation, lodging, etc.). ACs will ensure security team members receive a mission briefing, aircraft egress/passenger briefing (as appropriate).

7.4.2. Arrival. On arrival, the AC will assess the local situation and take the following actions as required:

7.4.2.1. Area patrol. Request area security patrols from local security forces. If local authorities request payment for this service, use AF Form 15, **USAF Invoice**.

7.4.2.2. Aircrew surveillance. During short ground times, direct armed crewmembers to remain with the aircraft and maintain surveillance of aircraft entrances and activities in the aircraft vicinity.

7.4.2.3. Inadequate security. If, in the AC’s opinion, airfield security is inadequate and the safety of the aircraft is in question, the AC may waive the flight duty period limits and crew rest requirements and depart as soon as possible for a base considered reliable. Report movement and intentions to the controlling agency as soon as practical. If departure is not possible, the aircrew must secure the aircraft to the best of their ability. In no case, will the entire crew leave the aircraft unattended. Crew rest requirements will be subordinate to aircraft security when the airframe may be at risk. The AC should rotate a security detail among the crew to provide for both aircraft protection and crew rest until relief is available. Request security assistance from the nearest DoD installation, US Embassy, local military or law enforcement agencies as appropriate.

7.4.3. Entry Control Procedures. Unescorted entry is granted to aircrew members and support personnel assigned to the mission who possess their home station AF Form 1199, **Air Force Entry Control Card**, supported by an entry access list (EAL) or aircrew orders. Aircrew members and assigned crew chiefs are authorized escort authority.

7.4.3.1. Normally, non-US nationals such as cargo handlers can perform their duties under escort and should not be placed on the EAL.

7.4.3.2. Personnel not on the entry control list or aircrew orders must be escorted within the area.

7.5. Detecting Unauthorized Entry.

7.5.1. When parking on a secure ramp, the aircraft will normally be left unlocked/unsealed to allow ground personnel immediate access. If, in the AC's judgment, the aircraft needs to be locked and sealed in order to detect unauthorized entry, then:

7.5.1.1. Use available aircraft ground security locking devices.

7.5.1.2. Secure the doors in a manner that will indicate unauthorized entry (e.g. tape inside of doors to airframe so that entry pulls tape loose).

7.5.1.3. Close and lock the crew entry door.

7.5.1.4. Wipe the immediate area around lock and latches clean to aid in investigation of a forced entry.

7.5.1.5. Report any unauthorized entry or tampering to the OSI, security forces or local authorities, and the C2 agency. Have aircraft thoroughly inspected prior to flight.

7.5.2. Security awareness is crucial to effective mission accomplishment. Aircrews must always remain vigilant to their surroundings, especially at high threat, low security locations. During preflight activities in such locations, aircrews will inspect accessible areas, to include aircraft wheel wells, keel beam bays and lower nose compartment for unauthorized packages, personnel, or other unfamiliar devices. Report any suspicious items to host security forces. Aircrews will maintain a heightened security posture throughout all pre-takeoff activities.

7.6. Preventing and Resisting Hijacking.

7.6.1. The Air Transportation Act of 1974 and the Federal Aviation Act of 1958, as amended, vest the FAA Administrator with exclusive responsibility for the direction of law enforcement activity in aircraft hijacking situations involving all aircraft (civil and military) in-flight in the United States.

7.6.2. In taking action during an aircraft hijacking situation, military forces will act under military command within the scope of their duties.

7.6.3. In the event an aircraft involved in an aircraft hijacking situation is carrying documents, equipment, or material that DoD has determined to be highly sensitive, or weapons of mass destruction, DoD will provide FAA, and where appropriate, the FBI, with all pertinent information. Where possible, the FAA will consult and cooperate with DoD prior to directing any law enforcement activity.

7.6.4. An aircraft is most vulnerable to hijacking when the aircrew is aboard and the aircraft is operationally ready for flight.

7.6.5. A concerted effort must be made to prevent the hijacking of military or military contract aircraft by detecting potential hijackers before they board the aircraft.

7.6.6. Should preventive efforts fail, any actual attempt to hijack a military aircraft must be resisted in a manner appropriate to the situation.

7.6.7. Since air piracy may be committed by political terrorists or by individuals to whom the threat of death is not a deterrent but a stimulus, ordinary law enforcement procedures may be ineffective. Thus, successful conclusion of a hijacking situation and apprehension of the hijackers may require use of specialized law enforcement techniques and procedures.

7.6.8. Delaying actions have been most successful in overcoming hijackings without loss of life or property.

7.6.9. In the case of an aircraft carrying passengers, the primary concern is the safety of the passengers.

7.6.10. Assistance to hijacked civil or military contract aircraft will be rendered as requested by the pilot in command of the aircraft and the authority exercising operational control of the anti-hijacking effort.

7.6.11. Tanker Responsibilities. When tasked for refueling or surveillance operations, the tanker will:

7.6.11.1. Immediately after launch, establish radio contact with the command and control element via HF.

7.6.11.2. Rendezvous with interceptors for air refueling or the hijacked aircraft for surveillance as soon as possible after takeoff.

7.6.11.3. If rendezvous is with the hijacked aircraft, assume a trail position out of cockpit and cabin view. Remain in an unobserved position unless otherwise directed. Safety is paramount; therefore, tanker aircraft will maintain a 5-NM trail in United States airspace and a 10-NM trail in Canadian airspace.

7.6.11.4. After direction to assume surveillance mission, continue until:

7.6.11.4.1. Fuel state dictates aborting to arrive at alternate with fuel reserves specified in this AFI.

7.6.11.4.2. Recalled by the command and control agency.

7.6.11.4.3. The hijacked aircraft's destination is determined to be a country requiring over flight clearance for the tanker. Contact a command center or command post for further direction. Until directed to over-fly sovereign airspace, maintain a 12-NM separation as specified in the Foreign Clearance Guide.

7.7. Preventive Measures. Commanders at all levels must ensure preventive measures are taken to minimize access to the aircraft by potential hijackers. When a C/KC-135 is operating away from home station, the AC will ensure provisions of this chapter and AFI 13-207, as supplemented, are complied with.

7.7.1. Preventive measures include the following: The host station passenger processing or manifesting facility should conduct anti-hijacking inspections. Do not board passengers until the AC is fully satisfied with inspection results. In the absence of qualified passenger service representatives, the AC will ensure the anti-hijacking inspection of passengers and baggage is accomplished.

7.7.2. Medical facility commanders are responsible for anti-hijacking inspection of patients. When patients are delivered to the aircraft by civilian sources, the aircrew will perform required inspections prior to loading.

7.7.3. During exercises or contingencies in support of combat operations involving the movement of large groups of personnel, the unit being supported should manifest passengers and perform anti-hijacking inspections.

7.7.4. Passengers will not carry weapons or ammunition on their person or in hand-carried baggage aboard an aircraft except special agents, guards of the Secret Service or State Department, and other individuals specifically authorized to carry weapons.

7.7.5. If weapons must be cleared, ask the individual to:

7.7.5.1. Move to a safe, clear area at least 50 feet from any aircraft, equipment, or personnel before unholstering or unslinging their weapons.

7.7.5.2. Clear weapons in accordance with standard safety procedures.

7.8. Initial Response. When an act of air piracy involves an Air Force installation or aircraft within the United States, response will be according to the following instructions until such time as FAA assumes active direction of anti-hijacking efforts. Resist all attempts to hijack a military aircraft. Resistance may

vary from simple discussion through deception and subterfuge, to direct physical confrontation, including the prudent use of weapons.

7.8.1. The following instructions should be used to counter a hijacking, actual or threatened, while the aircraft is on the ground:

7.8.1.1. Delay movement of the aircraft to provide time for ground personnel and the aircrew to establish communication and execute coordinated resistance actions.

7.8.1.2. The authority for determining when ground resistance will be discontinued is vested in the highest available level of command. When adequate communication cannot be established, or when time does not permit, this authority is delegated in the following order:

7.8.1.2.1. MAJCOM commander exercising operational control of the aircraft.

7.8.1.2.2. MAJCOM commanders in whose area of responsibility (AOR) the airfield lies.

7.8.1.2.3. Senior operational commander on scene.

7.8.1.2.4. AC in compliance with MAJCOM directives.

7.8.2. A hijacked aircraft carrying weapons of mass destruction will not be allowed to takeoff. Refer to DoD 5210.41M, paragraph 9B(3), for additional guidance.

7.9. In-Flight Resistance. After airborne, success in thwarting a hijacking depends on the resourcefulness of the aircrew. Many variables of a hijacking preclude use of any specific counter-hijacking procedure. Some key factors should be evaluated before deciding a course of action to be taken, including the nature of the threat, danger to life or crippling damage to the aircraft in-flight, destination indicated by the hijacker, and the presence of sensitive material onboard. Some counter-hijacking actions the aircrew may consider are:

7.9.1. Engage the hijackers in conversation to calm him or her and to evaluate what course of action might be effective.

7.9.2. Dissuade the hijacker.

7.9.3. Use facts or subterfuge to convince the hijacker intermediate stops are necessary.

7.9.4. Propose more favorable alternatives, such as landing in a neutral, rather than a hostile, country.

7.9.5. Exploit any reasonable opportunity to incapacitate or overcome the hijacker physically, including the prudent use of firearms.

7.10. Communications between Aircrew and Ground Agencies. Crews facing a hijacking threat will notify ground agencies by any means available as soon as practical and follow-up with situation reports as circumstances permit.

7.10.1. If possible, transmit an in-the-clear notification of hijacking to ATC. Controllers will assign IFF code 7500 (does not preclude subsequent selection of code 7700).

7.10.2. If in-the-clear transmissions are not possible, report "am being hijacked" by setting transponder to code 7500. If unable to change transponder code, or when not under radar control, transmit a radio message to include the phrase "(call sign) transponder seven five zero zero."

7.10.3. Controllers will acknowledge receipt and understanding of transponder code 7500 by transmitting "(call sign) (facility name) verify squawking 7500." An affirmative reply or lack of reply from the pilot indicates confirmation and proper authorities are notified.

7.10.4. For Official Use Only (FOUO). After a hijacking has been initiated, the aircrew may indicate to the ATC controller that in-the-clear communication is not possible (hijacker is in the cockpit) by using the word "Trip" after the aircraft call sign prefix (BOZO "Trip" 22). The controller responds by using the word "Trip" in the aircraft call sign. Use of "Trip" in the call sign by the controller, before being used by the aircrew, asks the crew if in-the-clear communication is possible. Respond to this query using "Trip" only if in-the-clear communication is not possible.

7.10.5. To report "situation appears desperate; want armed intervention," after code 7500 is used, change to code 7700. If unable to change transponder code to 7700, or when not under radar control, transmit "(aircraft call sign) transponder seven seven zero zero."

7.10.5.1. When changing from code 7500 to code 7700, remain on 7500 for at least 3 minutes or until a confirmation of code 7500 is received from ATC, whichever is sooner, before changing to code 7700. ATC acknowledges code 7700 by transmitting "(call sign) (facility name) now reading you on transponder seven seven zero zero."

7.10.5.2. Aircraft squawking 7700 after squawking 7500, which are not in radio contact with ATC, are considered by ATC to have an in-flight emergency (in addition to hijacking), and the appropriate emergency procedures are followed. Notification of authorities in this case includes information that the aircraft displayed the hijack code as well as the emergency code.

7.10.6. To report "situation still desperate, want armed intervention and aircraft immobilized", leave flaps and slats full down (50 degrees/LAND) after landing, or select flaps 50 degrees while on the ground. To facilitate message distribution, transmit "(aircraft call sign) flaps are full down."

7.10.7. To report "leave alone, do not intervene," retract the flaps/slats after landing. Pilots who retract flaps and slats after squawking 7700 should return to code 7500 and remain on code 7500 for the next leg of the hijacked flight unless the situation changes. Transmit "(call sign) back on seven five zero zero" to emphasize the fact intervention is no longer desired.

7.11. Forced Penetration of Unfriendly Airspace. These procedures are designed to deter possible hostile action against the hijacked aircraft that has been forced to penetrate airspace of a nation unfriendly to the United States.

7.11.1. If instructions from the unfriendly nation are received either by radio contact or by air intercept before boundary crossing, comply with instructions received.

7.11.2. If no contact with unfriendly nation is made before approaching a boundary:

7.11.2.1. Maintain TAS not more than 400 knots.

7.11.2.2. Maintain an altitude between 10,000 and 25,000 feet if possible.

7.11.2.3. Fly a direct course toward destination announced by the hijacker, if no course is specified.

7.11.2.4. Transmit the international distress signal, MAYDAY, on any of the international distress frequencies (121.5 MHz, 243.0 MHz, or 2182 KHz) in an effort to establish communications.

7.11.2.5. Set mode 3 code 7700 on transponder.

7.11.2.6. If radio contact cannot be established, follow procedures set forth in FLIP.

7.11.3. Consider the presence of classified documents and equipment aboard the aircraft. When a landing in an unfriendly nation is imminent, attempt to dispose of or destroy the equipment or material.

7.12. Arming of Crewmembers. When crews are directed to carry weapons, the AC will determine which crewmembers will be armed (two crewmembers will be armed unless directed otherwise). All crewmembers should know who is armed. The following procedures apply when arming is directed:

7.12.1. Issue. Before departing home station, obtain weapons, ammunition, box, lock and key. Crewmembers will be armed according to AFI 31-207, *Arming and Use of Force by Air Force Personnel* and MAJCOM publications. If an armed crewmember must leave the crew en route, transfer the weapon to another authorized crewmember using AF Form 1297, **Temporary Issue Receipt**.

7.12.2. Wearing of Weapons. Wear weapons in a holster, concealed at all times to prevent identifying armed crewmembers. Do not wear weapons off the flight line except to and from the C2 center, armories, and other facilities associated with aircrew activities.

7.12.3. Weapons storage in-flight. Crewmembers will be armed before beginning preflight, on-load or off-load duties and until completion of all post-flight duties. When no passengers are aboard, weapons may be stored in the gun box in-flight after a satisfactory stowaway check. Crewmembers will rearm before landing. Weapons need not be unloaded before placing them in a gun box.

7.12.4. Weapons storage pre/post-fight. Aircrews, including stage crews, will store weapons and ammunition in the most secure facility available, normally the base armory. Non-stage aircrews may store weapons and ammunition in the aircraft gun box.

7.12.5. Weapon storage in the gun box. Weapons should not normally be unloaded. Crew will advise C2 center as to which crewmember has the gun box key.

7.12.6. Crewmembers will ensure they are reissued the same weapon until mission termination at home station.

7.12.7. Loading and Transfer of Weapons. Load and unload weapons at approved clearing barrels if available. Do not use a hand-to-hand transfer of loaded weapons to another crewmember; place the weapon on a flat surface.

7.13. Force Protection. Crews must be alert to possibility of terrorist activities at all times. The following considerations may help crewmembers avoid becoming victims of terrorism when operating in overseas locations:

7.13.1. Personal conduct. Crews must realize their conduct can make them a target for individuals dissatisfied with US foreign involvement in their national affairs. Local foreign nationals may or may not condone a military presence - crew conduct will be watched and judged. Therefore, utilize the following:

7.13.1.1. Maintain good military bearing both on and off duty.

7.13.1.2. Avoid dressing in clothes that highlight the fact you are an American, i.e., cowboy hats, wide belt buckles, shirts with pro-American slogans, etc.

7.13.1.3. Do not wear clothing displaying profanity.

7.13.1.4. Know where “off-limits” areas are and avoid them.

7.13.1.5. Beware of personnel offering to take you on a “personal” sightseeing tour.

7.13.1.6. Do not get involved with anyone trying to involve you in games of chance.

7.13.1.7. When possible, always travel in groups of two or more.

7.13.1.8. Avoid demonstrations for any cause.

7.13.1.9. Avoid discussion of politics.

7.13.2. Ground transportation security. When traveling to and from billeting, messing facilities, etc. consider the following to minimize drawing attention to you as a potential target.

7.13.2.1. Vehicles.

7.13.2.2. Select a plain car; minimize the “rich American” look.

7.13.2.3. If possible, consider not using a car that announces Government ownership. Keep the gas tank at least half full at all times. Do a thorough check of the car to look for signs of tampering - look at undercarriage and wheel-wells. Park in well-lighted areas, preferably under US control. Always lock your car. If possible, do not leave it on the street overnight. Only leave the ignition key with parking attendants. Before entering vehicles, check for suspicious objects. Look underneath vehicle seats.

7.13.2.4. Travel.

Guard against establishing a routine. Vary times, routes, and modes of travel. Avoid late night travel.

Travel with companions or in convoys when possible.

Avoid isolated roads and dark alleys.

Ride with seat belts buckled, doors locked, and windows closed.

Do not allow the vehicle to be boxed in. Maintain enough interval between you and the vehicle in front so that you can pass.

Circle the block for confirmation of surveillance.

Do not stop or take other actions, which could lead, to a confrontation.

7.13.2.5. Recognize events that could signal the start of an attack, such as:

Cyclist falling in front of your car

Flagman or workman stopping your car.

Fake police or government checkpoints.

Disabled vehicle/accident victims on the road.

Unusual detours

An accident in which your car is struck.

Cars or pedestrian traffic that box you in.

Sudden activity or gunfire.

7.13.3. Know what to do if you are under attack:

Consider sounding the horn.

Put another vehicle between you and your pursuer.

Execute an immediate turn and escape, jump curbs at a 30-45 degree angle, 35-mph minimum.

Ram a blocking vehicle only as a last resort.

Go to the closest safe haven.

Report the incident to security police.

7.13.4. Personal identification. Consider the following actions to avoid advertising the fact you are an American. Remember, the key is to maintain a low profile.

7.13.4.1. Don't discuss our military affiliation with strangers.

7.13.4.2. Avoid military style luggage, B-4 bags & duffel bags with military logos, etc.

7.13.4.3. Consider placing your official passport and related documents such as military ID, flight orders, club card, dog tags, billeting receipts in your hand-carried luggage and not in your wallet or purse.

7.13.4.4. Wear conservative styled civilian clothing when using commercial transportation.

7.13.5. Hotel security. When billeted in commercial hotels, crews need to be aware of the following:

7.13.5.1. If possible, obtain rooms between the third and seventh floors. These rooms are high enough to be less vulnerable to unauthorized entry from the outside and low enough to simplify evacuation if necessary.

7.13.5.2. Always lock interior locks when occupying rooms.

7.13.5.3. Always assume your room is monitored and avoid viewing or discussing classified material.

7.13.5.4. Avoid establishing a predictable routine i.e., vary eating times and locations.

7.13.5.5. Avoid traveling on foot, use a vehicle (hotel shuttle, commercial taxi, etc.)

7.13.5.6. In high threat areas, stay off the streets (use hotel dining facilities if available).

7.14. Protecting Classified Material on Aircraft. The Aircraft Commander is responsible for protection of classified materials aboard their aircraft. See requirements in AFI 31-401, *Information Security Program Management*. As a minimum, insure the IFF equipment is set to zero before leaving the aircraft.

Chapter 8

OPERATIONAL REPORTS AND FORMS

8.1. General. Applicable reports and forms are contained in this chapter.

8.2. AF Form 457, USAF Hazard Report. (AFI 91-202, *The US Air Force Mishap Prevention Program*)

8.2.1. The Air Force hazard reporting system provides a means for Air Force personnel to alert supervisors and commanders to hazardous conditions requiring prompt corrective action.

8.2.2. Special Procedures for Hazard Reports Concerning Weather. Complete the front of an AF Form 457 and address it to the parent wing flying safety office. If a computer flight plan deficiency is involved, attach one copy of the AF Form 72, **Air Report (AIREP)**, MAJCOM-approved form AF Form 4115, **Flight Plan and Record**, or 488, **INS Flight Plan and Log**), and the CFP to the report. Send the report so that the parent unit receives it within 5 days.

8.3. AF Form 651, Hazardous Air Traffic Report (HATR). (AFI 91-202)

8.3.1. The Air Force HATR program provides a means for personnel to report all near midair collisions and alleged hazardous air traffic conditions.

8.3.2. Procedures:

8.3.2.1. Make an airborne report of the hazardous condition to the nearest air traffic control agency (e.g. center, FSS, control tower, or aeronautical radio station), and give the following information as appropriate:

8.3.2.1.1. Call sign.

8.3.2.1.2. Time and place (radial/DME of NAVAID, position relative to the airfield, etc.) of the occurrence.

8.3.2.1.3. Altitude or flight level.

8.3.2.1.4. Description of the other aircraft.

8.3.2.1.5. Statement that a written HATR report will be filed upon landing.

NOTE: FAA must know if an official report is being filed.

8.3.2.2. File the HATR as soon as possible (within 24 hours) using any available means of communication. Normally, it should be filed at the Air Force base operations office at the landing airport. If this is impractical and if communications permit, notify the safety office of the Air Force base where the condition occurred, the safety office at the home base, or as prescribed by the overseas major command. In any case, provide the base or wing safety office with all available information needed to prepare AF Form 651. Turn in a completed copy of AF Form 651 to the wing safety office.

8.3.3. Individuals who submit HATRs on incidents are granted immunity from disciplinary action provided: (1) Violation was inadvertent, i.e. not deliberate, (2) No mishap occurred, (3) No criminal

offense was intended or committed, and (4) The individual reported the incident according to paragraph **8.3.2.**

8.4. AF Form 711, USAF Mishap Report (Aircraft and Personnel Mishaps). *(Does not apply to AFRC or ANG)*

8.4.1. Responsibilities. Notify the appropriate authorities of any mishap involving aircraft or crew.

8.4.2. Reportable Mishaps. Report damage to the aircraft or injury to the crew or passengers. Also, any damage or injury to another organization's equipment or personnel resulting from the movements or actions of an AMC aircraft or crew. Reportable mishaps include:

8.4.2.1. Physiological mishaps.

8.4.2.2. Engine flameout, failure, or required shutdown, after engine start with intent for flight, regardless of damage. Report incidents involving two or more engines immediately. Single-engine incidents may be reported upon landing.

NOTE: Intentional shutdowns for training, FCF, or other non-emergency purposes are excluded; however, report failure to restart, using the criteria above.

8.4.2.3. Loss of thrust sufficient to preclude maintaining level flight at a safe altitude.

8.4.2.4. Engine case penetration by shrapnel from internal engine component failure.

8.4.2.5. Engine case rupture or burn-through, engine bay fire, or massive fuel leakage.

8.4.2.6. Unselected thrust reversal.

8.4.2.7. Flight control malfunction (including AFCS and trim systems) resulting in an unexpected, hazardous change of flight attitude, altitude, or heading. When making the AFTO 781A, **Maintenance Discrepancy and Work Document**, entry, include the flag words "reportable flight control malfunction."

8.4.2.8. Malfunction of landing gear when difficulty is experienced using emergency system or procedures.

8.4.2.9. Cargo door or ramp malfunction when intent for flight exists which could affect the integrity of the system.

8.4.2.10. In-Flight loss of all pitot-static instrument indications or all gyro-stabilized attitude or directional indications.

8.4.2.11. Spillage or leakage of radioactive, toxic, corrosive, or flammable material from aircraft stores or cargo that, in the judgment of the reporting individual, is significant hazard to the crew, passengers, or aircraft.

8.4.2.12. Human factors related situation, e.g. misinterpretation of instruments; crew overload, i.e. tactile, aural, and visual input to the crew at a rate too fast to permit reasonable decisions based on the data received; or too many actions required in too short a period of time; or confusion of controls such as would be caused by adjacent switches where the actuation of the wrong switch could create a dangerous situation. Anonymous reports of such situations are acceptable.

8.4.2.13. All cases of departure from intended takeoff or landing surface onto a surface not designed to normally support takeoff or landing loads.

8.4.2.14. All in-flight fires regardless of damage.

8.4.2.15. All bird strikes regardless of damage.

8.4.2.16. Any occurrence which does not meet the established criteria for a reportable mishap but, in the judgment of the reporting individual, needs to be emphasized in the interest of safety.

8.4.3. Procedures. Report mishaps as soon as possible to the following offices using the following precedence: (1) MAJCOM flying safety officer (FSO), (2) Any FSO, (3) Nearest C2 center, (4) Base operations. In all cases, retain a copy of all relevant information, and turn it into a home station safety officer.

8.4.4. Required Information. Complete all appropriate areas of the form. Provide as much detail as possible.

8.5. Reports of Violations/Unusual Events or Circumstances. Violations identified in AFI 11-202, Volume 3, *General Flight Rules*, alleged navigation errors (including overwater position errors exceeding 24 NMs, border and air traffic control violations) will be reported.

8.5.1. Use the following format and include: (1) Factual circumstances, (2) Investigation and analysis, (3) Findings and conclusions, (4) Recommendations, and (5) Actions taken.

8.5.1.1. Attachments to include: (1) Notification of incident, (2) Crew orders, (3) Statement of crewmembers (if applicable), and (4) Documenting evidence (logs, charts, etc.).

8.5.2. In addition to the information listed, the historical flight plan will be downloaded onto a floppy disk and turned in to the command and control facility or owning standardization and evaluation office.

8.5.3. Send the original investigation report within 45 days to the appropriate MAJCOM. AFRC units receiving alleged violations will send the original investigation through channels to arrive at HQ AFRC/IGI within 35 days. HQ AFRC/IGI will send the investigation report to the MAJCOM within 45 days.

8.5.4. The following OPREP-3 reporting procedures for all aircraft notified of navigational errors exceeding 24 NMs will be reported under AFMAN 10-206, *Operational Reporting*.

8.5.4.1. On notification of a navigational position error, the aircraft commander (or agency receiving notification) documents the circumstances surrounding the incident (report content below) and ensures submission of an OPREP-3 report through C2 channels.

8.5.4.2. Report content:

8.5.4.2.1. Name and location of unit submitting report.

8.5.4.2.2. Mission identification number.

8.5.4.2.3. Reference to related OPREPs-3.

8.5.4.2.4. Type of event. (State "Navigation position error.")

8.5.4.2.5. Date, time (zulu), and location (i.e. ARTCC area).

8.5.4.2.6. Description of facts and circumstances. Include aircraft type and tail number, unit (wing or squadron assignment of crew), home base, route of flight, point of alleged deviation, and miles off course.

8.5.5. ACs must keep MAJCOM C2 agencies apprised of any unusual events or circumstances impacting their missions. Examples of reportable events include meaconing, jamming, intrusion, interception, fuel dumping, loss of multiple engines, hostile fire, injury to passengers or crewmembers, etc. This list is not exhaustive. Some events may require the C2 agency to forward OPREP reports to higher headquarters.

8.6. Petroleum, Oil, and Lubricants (POL) - Aviation Fuels Documentation. This section describes procedures for the aviation fuel program (AVPOL) for all USAF aircraft. Procedures are established for correct documentation, processing of forms and invoices, program oversight, and personnel responsibilities. Reference AFI 23-202, *Buying Petroleum Products, and Other Supplies and Services Off-Station*, AMC decentralization procedures, and AFM 67-1, Volume 1, part 3. An Into-Plane contract information and Aviation Into-Plane Reimbursement (AIR) card acceptor list is also listed under the air card section on the following web page: http://www.kelly.af.mil/sfweb.

NOTE: Aviation Into-Plane Reimbursement (AIR) Card. The AIR card is a commercial credit card, which allows aircrews to purchase aviation fuel, fuel related supplies, and/or ground services at commercial airports where no DoD/Canadian into-plane contracts exist. Accepted at over 4200 locations, it is intended to replace the AF Form 315 **(United States Air Force AVFuels Invoice)** and AF Form 15 **(United States Air Force Invoice)** at locations that accept the AIR card. All Air Force aircraft will be issued an AIR card. Additional information is available at SF WEB page: (HTTP://WWW.KELLY.AF.MIL/SFWEB/AIRCARD.HTM).

8.6.1. Responsibilities. All aircrew and maintenance personnel will be familiar with the procedures and documentation requirements of this chapter. Purchase of aviation fuel not complying with this instruction may become the financial responsibility of the purchaser.

8.6.2. Aircraft will be refueled or de-fueled at DoD locations unless DoD-owned fuel is not available; in which case, fuel may be procured from other sources using the following priority.

8.6.2.1. Defense Fuel Supply Center (DFSC) or Canadian into-plane contracts.

8.6.2.2. Foreign government air forces.

8.6.2.3. Open market AIR card purchase, to include Shell International Trading Company (SITCO) agreement.

NOTE: DoD FLIP en route supplements identify locations with into-plane contracts.

8.6.3. AVPOL Documentation Use and Procedures.

8.6.3.1. AF Form 664, **Aircraft Fuels Documentation Log**-Used to log and store all AVPOL transaction documentation. Log all off station transactions on front of AF Form 664 then insert the supporting documentation inside the envelope. Turn AF Form 664, with supporting documentation, in at maintenance debriefing (or IAW locally established procedures).

NOTE: When logging in-flight on-load transactions on the AF Form 664, place the 8-digit tail number of the tanker in the block titled "Airfield Name," and the unit number and home station in the block titled "Airfield Address."

8.6.3.2. The AIR card will be used to purchase aviation fuel, fuel related supplies, and ground services at commercial airports where DoD or Canadian Into-Plane contracts do not Exist. Tickets for AIR card purchases will be recorded and placed inside the AF Form 664.

8.6.3.3. AF Form 315, **United States Air Force Avfuels Invoice**. Use this form to purchase fuel at non-DoD and Canadian Into-Plane contract locations and when the vendor will not accept the Air card. See AFI 23-202, *Buying Petroleum and Other Supplies and Services Off-Station*. Block 4 (Send Bill To) address on the AF Form 315 must reflect the following address: SA-ALC/SFR, 1014 Billy Mitchell Blvd, STE 1, Kelly AFB TX 78241-5603. When completed, log and place inside the AF Form 664.

NOTE: Vendor must submit original copy of completed AF Form 315 with their invoice to the address indicated in Block 4 for payment. Contrary to what is printed in Block 16 of AF Form 315, the vendor will not be paid until they initiate billing to SA-ALC/SFR.

8.6.3.4. AF Form 15, **United States Air Force Invoice.** This form is used for procurement of items or services required at commercial locations where normal DOD support and supplies are not available. If the vendor will not accept the AIR card, use AF Form 15 to pay for ground fuels, oils, or services. Block 4 (Send Bill To) of the AF Form 15 must reflect the address of the home-station supporting DFAS-OPLOC. When completed, log and place inside AF Form 664. The accomplished form is returned to the aircraft's home station for payment. The responsible resource advisor must validate and certify the completed AF Form 15 and forward to the supporting DFAS-OPLOC for payment. See AFI 23-202.

8.6.3.4.1. Provide the original and one legible copy of the AF Form 315 or 15 to the vendor. The vendor must submit the original copy of the AF Form 315/15 to the address identified in Block 4 of these forms for payment. A legible copy of the AF Form 315/15 must be obtained by the aircraft commander, then logged and placed inside the AF Form 664.

8.6.3.4.2. Purchases at Canadian into-plane locations will be documented using the local vendor's invoice. AF Form 15 or 315 will not be accomplished. Hand scribe the information from the aircraft identaplate to the vendor's invoice, and complete a separate sheet with the information listed on the Aviation Issues to DoD and Non-DoD, Aircraft Refueling Tender Sheet. See AFI 23-202. Log and place a copy inside the AF Form 664.

8.6.3.4.3. Purchases at SITCO Agreement locations require presenting the aircraft identaplate (DD Form 1896). The invoice must include the date of transaction, grade of the product, quantity issued or defueled, unit of measure, and signature of the Air Force representative. If the vendor also requires completion of an AF Form 15 or 315 in addition to their invoice, annotate on the vendor's invoice "AF FORMS EXECUTED." Log and place the documentation inside the AF Form 664.

8.6.3.4.4. Purchases at non-contract (DoD/Canadian Into-Plane) commercial airports will be accomplished using the AIR card or the AF Form 315 and/or AF Form 15 when vendor does not accept the AIR card. Refer to AFI 23-202 for on completing these forms.

8.6.3.4.5. Purchases at foreign military airfields, including replacement-in-kind (RIK) locations, the host country forms are used to record the purchase. Information from the aircraft identaplate should be hand scribed on the local form. Log and place a copy inside the AF Form 664.

8.6.3.4.6. If an embassy arranges fuel support and pays the vendor in cash, an AF Form 315 must be completed with the addition of the statement in Block 11: "paid by US Embassy". Also include in Block 11, the date, POC, and telephone number of responsible embassy employee. When completed, attach vendor ticket, then log and place inside AF Form 664.

NOTE: In this situation, do not leave copies of the AF Form 315 with the vendor. Base wing refueling document control officers will forward AF Form 315 to SA-ALC/SFR.

8.6.4. AF Form 791, **Aerial Tanker In-Flight Issue Log.** Used for all in-flight off-load transactions. All blocks are required to be filled out with the exception of the gallons. Tail numbers for the tanker and receivers must be the 8-digit numbers. When completed, log and place inside AF Form 664 or turn in according to locally established procedures.

8.6.4.1. When on AMC directed operational air refueling missions supporting priority 2 or higher missions, ACs will contact HQ AMC TACC/XOC (HILDA) and pass the following:

8.6.4.1.1. A/R complete time.

8.6.4.1.2. Actual off-load.

8.6.4.1.3. Reason(s) A/R not accomplished (if applicable).

8.6.4.1.4. If unable to contact HILDA in-flight, AC will pass data prior to entering crew rest at destination base.

8.6.5. AF Form 1994, **Fuel Issue/De fuel Document.** Used for purchases at all US Air Force locations using a valid DD Form 1896, **Jet Fuel Identaplate**. Log and place inside AF Form 664.

8.6.6. AFTO Form 781H, **Aerospace Vehicle Flight Status and Maintenance Document**. Complete form per applicable technical directives. When removed from jacket, turn in to maintenance. Maintenance will retain for 90 days after inter-fund billing to provide a secondary audit trail for fuels issue and flying hours.

8.6.7. DD Form 1896, **Jet Fuel Identaplate**, aircraft fuel and oil charge card.

8.6.8. DD Form 1898, **AVFuels Into-Plane Sales Slip**, fuel transaction receipt is used for purchases at other DoD locations, including DFSC into-plane contract locations. Log and place inside AF Form 664.

NOTE: If the contractor insists on completing their own invoice in addition to the DD Form 1898, the invoice must be annotated "DUPLICATE DD FORM 1898 ACCOMPLISHED."

8.6.9. Aircraft Commanders. ACs will:

8.6.9.1. For local training missions:

8.6.9.1.1. Verify that AF Forms 791 and AFTO Form 781H are completely filled out prior to maintenance debriefing.

8.6.9.1.2. Turn in AFTO Form 781H to maintenance debriefing. Turn in AF Forms 791 IAW with local procedures.

8.6.9.2. For off station missions:

8.6.9.2.1. Verify that AIR card receipts, AF Forms 15, 315, 664, 791, 1994, AFTO Form 781H, DD Form 1898, and all associated fuels receipts are completely filled out and placed inside the AF Form 664. (All USAF aircraft must contain an 8-digit tail number).

8.6.9.2.2. Ensure that AF Form 664, with all refueling documentation and the AFTO Form 781H are turned in at maintenance debriefing.

8.6.9.2.3. Ensure that all AF Forms 664 and 791 information is phoned, faxed, or sent by message back to the ICO if aircraft is to be off station past the last day of the month.

NOTE: When situations arise that preclude the transmission of AF Form 664 data, the information will be relayed on arrival from the first available AMC command post.

8.6.10. Boom Operators will:

8.6.10.1. Ensure receiver MDS, unit of assignment, and home station are available on the flying schedule.

8.6.10.2. Prior to off-loading any fuel, ascertain the receivers 8-digit tail number using:

8.6.10.2.1. Interplane radio, if communications will not compromise tactics, clandestine or covert operations or safety of flight.

8.6.10.2.2. Boom interphone on those aircraft so equipped.

8.6.10.2.3. Visual if the receiver has the tail number clearly visible.

NOTES:

Training under EMCON 2 or 3 will not preclude the use of interplane radios for obtaining or verifying air refueling data.

Under NO circumstances shall interplane radios be used during actual EMCON 2, 3, or 4 to obtain or verify air refueling data, unless specifically authorized by competent authority. Utilizing HAVE QUICK II and secure voice should be considered.

8.6.10.3. Under no circumstances will any of this data be obtained by any means, which would interfere with or threaten safety of flight.

8.6.10.4. Information not obtained prior to or in-flight shall be obtained after the flight.

NOTE: An AF Form 791, which is incomplete after all means to obtain the required data have been exhausted, shall be turned in with a brief explanation. Units will develop a local procedure to ensure required information is obtained prior to final processing of the form.

8.6.10.5. Utilization of "known" or "suspected" aircraft serial numbers assigned to the unit being refueled, but not necessarily the actual aircraft refueled, will not be used. Receiver unit aircraft serial numbers are compared to the fuel load reports at their home station, and if the aircraft tail number being billed was in fact in maintenance or for some other reason not able to fly, the fuel bill will be rejected and the tanker unit will be liable for the fuel.

8.6.10.6. Units will establish AF Form 791 procedures for classified in-flight refuelings.

8.6.11. Maintenance Personnel. Maintenance Personnel will:

8.6.11.1. Local Training Missions: Ensure all in-flight refueling documentation, i.e. AF Form 791 and the AFTO Form 781H are completed and collected for each mission, if required.

8.6.11.2. Off station Missions:

8.6.11.2.1. Ensure that all ground refueling/de-fueling documents are accurately completed and placed inside AF Form 664.

8.6.11.2.2. Prior to deployment, ensure an adequate supply of fuels transaction documents are onboard the aircraft to complete the deployment.

8.7. AMC Form 54, Aircraft Commander's Report on Services/Facilities. (AMC, ANG and AFRC only). This is an instrument for aircrews to report that services rendered or conditions encountered were unsatisfactory or detrimental to efficient air mobility operations; services rendered or procedures used are worthy of adoption for all MAJCOM organizations; or a performance rendered by a person (or persons) was commendable and deserves recognition. Attempt to solve problems by contacting appropriate supervisors including the senior commander if conditions and situation warrant. If further action is deemed necessary or the problem requires increased visibility, submit this form. Deliver the completed form as follows: To the command post. Locations with no command and control facility-give the form to the senior representative. Locations with no senior MAJCOM representative-give the form to next en route command post. This report is designated emergency status code C1; continue reporting during emergency conditions, priority precedence. Submit data requirements in this category as prescribed or by any means possible to ensure arrival on the established due dates. Discontinue electronic reporting during MINIMIZE.

8.8. AMC Form 43, AMC Transient Aircrew Facilities Report. , (AMC, ANG, and AFRC only). Any crewmember may submit this form. The report may be submitted whether or not an unsatisfactory item is included in the AC's trip report. Complete AMC Form 43 and send to HQ AMC/MWPS.

8.9. AMC Form 196, Aircraft Commander's Report on Crewmember. (AMC AD only). The AC will prepare an AMC Form 196 on each crewmember whose performance was outstanding, below average, or unsatisfactory during a mission. Send the report to the commander of the unit to which the crewmember is assigned or attached for flying. Form should fully explain outstanding, below average, and unsatisfactory performance.

8.10. MAJCOM-Approved MIJI (Meaconing, Intrusion, Jamming, Interference) Incident Report Worksheet.

8.10.1. Purpose. The MIJI reporting system is a program to identify, analyze, and disseminate information concerning MIJI incidents.

8.10.2. Procedures. Comply with Air Force headquarters direction by reporting all incidents through the OPREP (operations reporting) system. Complete the MIJI Incident Report Worksheet, and turn in to base operations upon landing.

8.11. AF Form 3578 , Tanker Activity Report (TKACT). The pilot according to AFI 11-222, *Tanker Activity Report*, accomplishes tanker activity reporting.

Chapter 9

TRAINING POLICY

9.1. Qualification Training. Initial qualification, re-qualification, or upgrade training for pilots will not be conducted on missions with passengers onboard. Mission qualification training, Operational Mission Evaluations, Line Development Missions, and JA/ATTs may be conducted on missions with passengers onboard only if the individual in training is qualified (completed aircraft checkride with a valid AF Form 8).

9.2. Flight Maneuvers. The following maneuvers are authorized for qualification and continuation training. Perform maneuvers restricted to CCTS and CFIC-only during formal training under direct CCTS or CFIC instructor supervision. They are applicable to all mission and series C/KC-135 aircraft, except when prohibited or restricted by the flight manual or other current directives. When necessary, use specific model procedures in the appropriate -135 techniques pamphlet. Direct instructor-pilot (IP) supervision requires the IP to have immediate access to the controls.

9.2.1. Authorized Maneuvers.

9.2.1.1. Simulated Engine Failure in the Traffic Pattern (IP or qualified AC).

9.2.1.2. Approach and Landing, Simulated Engine-Out (IP or qualified AC).

9.2.1.3. Approach and Go-Around, Simulated Engine-Out (Power Rudder On) (IP or qualified AC).

9.2.1.4. Approach and Go-Around, Simulated Engine-Out (Power Rudder Off) (direct IP supervision).

9.2.1.5. Landing, Simulated Engine-Out, 4-Engine Takeoff (direct IP supervision).

9.2.1.6. Simulated Engine Failure Takeoff Continued (direct IP supervision).

9.2.1.7. Simulated 2-Engine Landing (using 3 or 4 engines, except CFIC) (direct IP supervision).

9.2.1.8. Simulated Jammed Stabilizer Demonstration (spoiler use only) (direct IP supervision).

9.2.1.9. Landing Attitude Demonstration (direct IP supervision).

9.2.1.10. Spoiler/Lateral Control Demonstration (IP supervised).

9.2.1.11. Trim Demonstration (IP supervised).

9.2.1.12. Simulated Engine Failure on the Runway (CFIC only).

9.2.1.13. No-Airspeed or AOA Approach and Landing (CFIC only).

9.2.1.14. Bounce Recovery or Low Altitude Go-Around Demonstration (CCTS and CFIC only).

9.2.1.15. Combat Departure (OFT only).

9.2.1.16. Runaway Stabilizer Trim (OFT only).

9.2.1.17. Initial Buffet (OFT only).

9.2.1.18. Threat Avoidance Approach/Departure (TAA/D) (qualified IP/AC).

9.3. Touch and Go Landing Limitations.

9.3.1. Touch and go landings will only be accomplished under the direct supervision of an IP or Sq/CC certified AC.

9.3.2. An in-flight evaluation and Sq/CC certification will be accomplished prior to an AC accomplishing touch and gos without direct IP supervision. The evaluation should occur in conjunction with the initial qualification evaluation. After successful evaluation, ACs must be evaluated on recurring evaluations to maintain touch and go qualification.

9.3.3. AC touch and go certification:

9.3.3.1. ACs must have accumulated a minimum of 50 hours (not including other time), since AC qualification, prior to touch and go certification.

9.3.3.2. The Sq/CC determines touch and go certification requirements for ACs.

9.3.3.3. Separate Sq/CC certifications are required for ACs to: (1) Accomplish their own touch-and-go landings, and (2) Supervise other pilots' touch-and-go landings.

9.3.3.4. Certification will be documented in the individual's FEF.

9.3.4. Touch-and-go landings are authorized under the following conditions:

9.3.4.1. Flight manual restrictions and procedures apply.

9.3.4.2. Use a runway of sufficient width and length to permit a safe, normal, full stop landing.

9.3.4.3. Minimum ceiling of 1000 ft and minimum visibility of 2 miles for ACs.

9.3.4.4. Minimum ceiling of 300 ft and RVR 4000 (3/4 SM visibility) with direct IP supervision.

9.3.4.5. Wet runway or RCR must be a measured 9 or higher.

9.3.4.6. Do not accomplish touch-and-go landings on slush covered runways.

9.3.4.7. Maximum crosswind component is 15 knots (10 kts for ACs).

9.3.4.8. Do not accomplish touch-and-go landings with less than 10,000 pounds of useable fuel.

9.3.5. Supervision of touch-and-go landings. Review the following:

9.3.5.1. Flight manual procedures.

9.3.5.2. Abort considerations.

9.3.5.3. Engine failure, including recognition and corrective action.

9.3.5.4. Proper use of spoilers, flaps, trim.

9.3.6. To provide additional training flexibility, crews may perform multiple approaches, and if qualified, touch-and-go landings on operational airlift (TWCF) missions provided the following requirements are met:

9.3.6.1. All transition training will be accomplished during the first 12 hours of the FDP only.

9.3.6.2. Pre-mission coordination requirements. As part of pre-mission planning, ACs will contact parent wing current operations and obtain training mission number(s) for use at each en route location(s) where training events are planned. In addition, ACs will coordinate with and receive approval from the airfield(s) where training is to be accomplished. They will then coordinate with

the TACC to ensure adequate ground time is available at planned training locations to allow for planned training events, clearing customs, required crew rest, etc. Once complete, wing current operations will coordinate with TACC to re-cut the mission and add the training mission number(s) in GDSS/C2IPS.

9.3.6.3. Upon initial arrival at the training location, close out the current line on the AFTO Form 781 and log the training time on the next line using the appropriate training mission symbol and number.

9.3.7. Touch-and-go landings may be performed with cargo on board provided:

9.3.7.1. AC and boom operator must determine the suitability of the cargo. **Touch-and-go landings with hazardous cargo on board are prohibited.**

9.3.7.2. Cargo security is checked prior to the first touch-and-go and thereafter at an interval determined by the AC (normally not to exceed 1 hour). ACs must allow additional time required for this inspection.

9.4. Engine Out Limitations. (Simulated*).* Do not practice actual engine shutdown:

9.4.1. Performance. Paragraph **9.6.2.** requirements apply. Do not simulate failure of two engines in flight (simulator only demonstration, except CFIC).

NOTE: During a go-around or missed approach, use the asymmetric engine as required to ensure at least a 2.8 climb gradient.

9.4.2. AC upgrades and ECPs may practice simulated engine-out maneuvers under direct IP supervision.

9.4.3. Weather Minimums:

9.4.3.1. Maximum crosswind for simulated engine-out landings is 15 knots.

9.4.3.2. Day -Circling weather minimums for the approach being flown (600/2 if none published).

9.4.3.3. Night -1000 feet and 2 miles or the circling weather minimums for the approach being flown whichever is higher.

9.4.4. Engine failure takeoff continued will not be accomplished below 200 feet AGL (except CFIC).

9.5. Not Used.

9.6. Operating Limitations.

9.6.1. Policy: Unless specifically authorized elsewhere in this section, do not practice emergency procedures that degrade aircraft performance or flight control capabilities (in-flight).

9.6.1.1. Rudder power will be on for all takeoffs and landings. The EFAS will be on for all KC-135R/T takeoffs and landings.

9.6.1.2. The pilot or IP will alert all crewmembers prior to practicing emergency procedures.

9.6.1.3. In an actual emergency, terminate all training and flight maneuvers practice. Training should be resumed only when the pilot in command determines it is safe.

9.6.2. Performance Requirements. Do not practice traffic pattern operations, instrument approaches, low approaches or go-arounds at gross weights that will not afford a minimum of 2.8 climb gradient at threshold speed minus 10 knots, 3 engines, flap 30, gear down, symmetric N1/EPR setting and selected asymmetric N1/EPR setting (between idle and maximum asymmetric N1/EPR).

9.6.3. Option Approach and Visual Low Approaches. Initiate a planned missed approach not later than:

9.6.3.1. Precision approach - DH (or 200-feet HAT, whichever is higher).

9.6.3.2. Non-precision approach - missed approach point (MAP).

NOTE: Does not preclude landing attitude demonstration.

9.6.4. Airborne Radar Approach (ARA). Comply with the following conditions when performing an ARA (Do not attempt to accomplish an ARA aboard a Pacer CRAG-modified aircraft):

9.6.4.1. Perform an ARA using a DoD or FLIP terminal non-precision approach procedure.

9.6.4.2. The pilot monitoring the ARA will terminate the ARA and resume radio navigation any time the aircraft approaches full-scale course deflection for the instrument approach procedure being used.

9.6.4.3. ATC clearance will be obtained for the selected non-precision approach.

9.6.4.4. ATC should be advised ARA procedures are being used.

9.6.5. Normally, do not exceed 30 degrees of bank during traffic pattern operations.

9.6.6. Practice Emergency or Abnormal Gear and Flap Operation. Accomplish clear of clouds (not applicable when IP-supervised). May be accomplished day or night.

9.7. Landing Limitations. The following limitations apply to touch-and-go and full stop landings:

9.7.1. Flap setting - Do not practice landings with less than 30 flaps.

9.7.2. Gross weight. Normally, landing gross weights will not exceed 200,000 pounds. However, providing that circumstances permit, a C/KC/EC-135 aircraft commander should consider/seek landing approval above 200,000 pounds as an alternative to fuel load adjustments. If mission requirements dictate and a safe stopping distance exists, the OG/CC (for local missions or TACC directed missions whilst the aircraft is in the local area), or HQ AMC/DOV for all other circumstances (user commands define in MAJCOM supplement) may authorize a full stop landing up to a maximum 225,000 pounds on a case-by-case basis (see waiver protocol in **Chapter 4**). Comply with flight manual sink rate limitations. Only MAJCOM/DO may authorize landings above 225,000 pounds up to flight manual weight limits.

9.7.3. Multiple full stop landings - Compute brake energy prior to each subsequent takeoff.

9.8. Prohibited In-Flight Maneuvers. The following maneuvers are prohibited in-flight:

9.8.1. Stalls.

9.8.2. Dutch roll.

9.8.3. Emergency descent.

9.8.4. Unusual attitudes.

9.8.5. Compound emergencies (except simulated engine-out with rudder power off or FCAS off).

9.8.6. Tactics maneuvers (except those specified in **Chapter 17**, or those specifically authorized by MAJCOM-approved) or listed in training tables.

9.8.7. Initial buffet.

9.8.8. Turns greater than 45 degrees bank (except MAJCOM-approved tactics maneuvers).

9.9. Training/Evaluation Briefing. Before all training/evaluation missions, ACs or instructors/flight examiners will brief their crews on the following additional items:

9.9.1. Training/Evaluation requirements. Instructors/evaluators (for each crew position) will outline requirements and objectives for each student or examinee.

9.9.2. Planned training area and seat changes.

9.10. Debriefing. Review and evaluate overall training performed. Each student or aircrew member should understand thoroughly what training has been accomplished. Ensure all training is documented.

9.11. Simulated Instrument Flight. Artificial vision restricting devices are not authorized for any phase of flight. Simulated instrument flight may be flown and logged without the use of a vision-restricting device.

Chapter 10

LOCAL OPERATING PROCEDURES

10.1. Units define local operations procedures in this chapter.

Chapter 11

NAVIGATION PROCEDURES

11.1. General Information. For Pacer CRAG 4-person navigation see Chapter 6, **Section 6H**.

11.1.1. This chapter lists navigation requirements with a basic crew composition of two pilots, one navigator, or one navigation system operator (NSO) and one boom operator performing duties in accordance with the appropriate flight manuals on standard and avionics relocation program (ARP) configured KC-135 aircraft.

11.1.2. Primary navigator duties include: preflight mission planning, in-flight navigation, time control, weather avoidance, air refueling rendezvous, cell formation station keeping, command and control communications, Emergency War Order (EWO) and tactical aircraft operations, flight safety observer and abnormal or emergency procedure assistance.

11.1.3. NSO qualification does not include: celestial, grid, manual DR, receiver air refueling, or EWO. NSOs will comply with all other sections of this chapter.

11.1.4. **Figure 11.1.** and **Figure 11.2.** depict navigation chart and log symbology and typical navigation chart usage.

11.2. Common Terms:

11.2.1. Nav Judgment. The art of relying upon navigator experience, techniques, and procedural information to resolve conflicting navigational data.

11.2.2. Position. Aircraft location at a specific time. A position is normally identified by either navaid radial(s) and DME or by INS/DNS geographical coordinates. Three types of positions include: DR, Fix, and MPP.

11.2.3. Dead Reckoning (DR). DR is the primary means of navigation. DR is a mathematical projection of the aircraft position from a previous position, calculated by averaging the heading, true airspeed, wind direction and wind speed over a specific period of time. DR may be manual or automatic.

11.2.3.1. Manual DR. Calculated by the navigator who manually advances the aircraft position by recording average instrument readings on the navigation log, calculates a course and distance and then plots the result on a navigational chart. Manual DR includes: Ground Plot DR (combined air path and wind vectors) and Air Plot DR (independent air path and wind vectors).

11.2.3.2. Automatic DR. Calculated by Inertial Navigation System (INS) and Doppler Navigation System (DNS) computers, which automatically advance the aircraft's position.

11.2.4. Fix . A position with the potential for high accuracy, obtained from any aid to DR capable of providing intersecting LOPs.

11.2.5. Most Probable Position (MPP) . Most Probable Position (MPP). A position with the potential for improved accuracy, obtained by updating the location of a DR with data obtained from any aid to DR. The term MPP applies to all DR positions updated by a single LOP, it also applies to any DR position partially updated by intersecting LOPs.

11.2.6. Aids to DR. Navigation information used to verify or update the aircraft position, include: ground mapping radar, radio aids (TACAN, VOR), GPS, celestial and pilotage.

11.2.7. Line of Position (LOP). Navigation data obtained from any aid to DR.

11.2.7.1. Single LOP. Single LOPs may be used to update a DR position to a MPP. Aids to DR capable of providing single LOPs included: radar (bearing or distance), GPS present position coordinates, radio aid (radial or DME), celestial (single body), and pilotage (visual bearing or distance).

11.2.7.2. Intersecting LOPs. Two or more intersecting LOPs may be used to update a DR position to either a fix or a MPP. Aids to DR capable of providing intersecting LOPs include radar (bearing and distance, intersecting bearings, intersecting distances), radio aid (radial and DME, intersecting radials, intersecting DME), celestial (intersecting LOPs), and pilotage (visual bearing & distance).

11.2.8. Initial Level-Off . The time (Greenwich mean time [GMT]) the aircraft completes a published (i.e. SID) or radar vector departure and reaches planned en route altitude. If mission change or en route (ARTCC) delay prevents reaching planned altitude, initial level-off is 30 minutes after aircraft takeoff time.

11.2.9. General Navigation. Begins at initial level-off or when cleared off SID/cleared on course. Ends when the crew, at the AC's direction, transitions to radio aid navigation to the terminal facility.

11.3. Mission Planning.

11.3.1. Responsibility. The aircrew or an appropriate staff planning agency will complete a mission flight plan in accordance with the flight manual and associated directives anytime a scheduled mission departs the local traffic pattern. If prepared by staff, the aircrew is responsible to review and ensure the accuracy of the plan.

11.3.2. Mission Flight Plans. Mission flight plans may be completed either by computer or manually. Navigators will maintain proficiency in both computer and manual mission planning. As a minimum, mission flight plans will include the route of flight (navaid radial/DME and coordinates), best available en route winds, appropriate headings and airspeed, en route times, air refueling information, and a fuel log.

11.3.2.1. Computer Flight Plans. For training and tactical mission planning, use MAJCOM approved software. In the absence of MAJCOM approved software, units are responsible for ensuring computer based planning software is current and appropriate to the mission. For strategic mission planning reference see AMCI 11-208, *AMC Tanker/Airlift Operations*. Strategic mission planning, under direct control of the Tanker Airlift Control Center (TACC), includes Special Assignment Airlift Missions (SAAM), higher headquarters missions, and channel missions.

11.3.2.2. Manual Flight Plans. Navigators may be required to prepare a manual flight plan: (1) When computer flight planning is not available, (2) To maintain aircrew planning proficiency, or (3) To accommodate short-notice mission changes.

11.3.2.3. Fuel Conservation. Plan missions in accordance with paragraphs **5.17.** and **6.22.** of this instruction.

11.3.2.4. Air Refueling. Circumstances permitting, tanker aircrew(s) should coordinate with either the receiver aircrew(s) or the receiver's scheduling unit prior to departure to ensure air refueling information accuracy.

11.3.2.5. Navigation Legs. Whenever practical, plan navigation legs concurrent with en route "dead-time" which normally occurs while flying directly to or from an A/R track or anchor area. The intent is to save flight time and reduce the number of classic dogleg style nav legs. Navigation legs may be flown concurrent with A/R. However, do not accomplish celestial observations while on the A/R track or within the anchor area. Do not plan navigation legs: (1) During departure, prior to level off and prior to the planned departure point, (2) During A/R, from 20 minutes prior to the ARCT until 10 minutes past the ARCP, (3) During arrival, from 10 minutes prior to the planned en route descent point, initial position of a STAR, or high altitude IAF until landing.

11.3.3. Navigation Charts:

11.3.3.1. Draw the route of flight on an appropriate navigation chart (normally JNC or GNC) in accordance with the flight manual and associated directives.

11.3.3.2. Charts may be copied from a locally prepared master chart bank. The navigator is responsible to review and ensure the accuracy of the chart.

11.3.3.3. Annotate restricted, warning, or prohibited airspace on the chart if the special-use airspace is in the planned altitude structure and within 50 NM of the intended route-of-flight. Crews should be aware of special-use airspace along the entire route of flight. Comply with special-use airspace requirements in the flight information publication (FLIP). (N/A 65 AS).

11.3.3.4. Annotate the Air Defense Identification Zone (ADIZ) for all flights conducted off airways, which penetrate the ADIZ on the inbound leg.

11.3.3.5. Prior to departure, the navigator will cross check the mission flight plan with the ATC flight plan (DD Form 175 or DD Form 1801) to verify route of flight accuracy.

11.3.3.6. Upon mission completion, turn in ATC flight plan, mission flight plan, charts, navigation logs, celestial precomps, and associated materials to the squadron. Squadrons will retain this mission package for a minimum of three months.

11.3.3.7. Annotate classification on chart.

11.3.3.8. Annotate threat information and bullseye points on chart where applicable.

11.4. Navigation Incident Report. ***(not applicable ANG and AFRC units)***. Navigation incident reporting procedures, including confirmed (i.e. voice communication by air traffic control (ATC) agency) or suspect (i.e. navigation leg reconstruction), are in **Chapter 8** of this AFI. MAJCOMs will investigate navigation incident reports and violations according to AFI 11-202 Volume 3, *General Flight Rules*, and AFI 90-301, *Inspector General Complaints*.

11.5. General Navigation Procedures:

11.5.1. Fixing:

11.5.1.1. As a minimum, obtain the following fixes:

11.5.1.1.1. Obtain an initial fix at either the planned departure point or the final level off point. In either case, the initial fix time will not exceed takeoff time plus 30 minutes.

11.5.1.1.2. Obtain subsequent en route fixes at intervals not to exceed 30 minutes from the previous fix.

11.5.1.1.3. Terminate the 30-minute fixing requirement and record a position when any of the following conditions are met: (1) Arrival at the initial point of a STAR, (2) Arrival at the high altitude IAF, or (3) Start of an en route terminal descent.

11.5.1.2. Radar fixing is the primary means to determine the aircraft's position and verify or update DR positions. Use radar fixing to the maximum extent possible.

11.5.2. Dead Reckoning (DR):

11.5.2.1. Use automatic DR to the maximum extent possible. The use of manual DR is not required if accurate automatic DR capability exists.

11.5.2.2. Anytime after inserting waypoints into DR computers, complete a waypoint cross check to verify the accuracy of the inputted coordinates. This cross check may be accomplished either by rechecking the inserted waypoint coordinates or by verifying the correct distance between waypoints using the CDU Distance/Time function. If the computer "remote" function is used, the waypoint cross check should be accomplished using the opposite automatic DR computer.

11.5.2.3. Shortly following takeoff, complete an INS/DNS or INS/INS automatic DR crosscheck. Ensure the automatic DR computers are operational, the present positions are accurate and the waypoint steering is set as desired. Present position accuracy may be determined by any appropriate means, to include mental DR. Following a valid crosscheck, automatic DR may be used for in-flight navigation and if desired coupled to the autopilot/flight director for steering commands.

11.5.2.4. Verify automatic DR present position accuracy at intervals not to exceed 30 minutes. This verification is normally accomplished in conjunction with the 30-minutes general navigation fixing requirements. TACAN mixing of the INS/DNS or INS/INS will not satisfy the requirement for systems verification.

11.5.2.5. Update automatic DR computers as necessary to ensure the computer present position remains within 5 NM of the actual aircraft position. This update requirement does not apply to malfunctioning automatic DR equipment that is not being used for navigation.

11.5.2.6. Verify the accuracy of the GPS position prior to updating any automatic DR system. Do not use any hand-held GPS as the primary source of navigation. The Bendix/King KLX 100 hand-held GPS is widely used on KC-135 aircraft. This GPS unit does not include receiver autonomous integrity monitoring (RAIM) to verify signal integrity. It is not authorized by the FAA for IFR operations.

11.5.2.7. Long-range TACAN mixing should normally be avoided because it may degrade automatic DR accuracy.

11.5.2.8. Simultaneous TACAN mixing of automatic DR computers will not be accomplished because it limits the number of independent aids to DR.

11.5.2.9. The navigator is responsible for maintaining the accuracy of the INS/INS or INS/DNS. The pilot team should coordinate with the navigator prior to inserting waypoints, changing the steering problem or TACAN mixing either automatic DR computer.

11.5.3. Navigation Log:

11.5.3.1. Maintain an in-flight log on all missions. Use the log to assist with in-flight navigation calculations, provide a mission history and record significant events. In-flight log requirements

should not interfere with the navigator's primary task of directing the aircraft to mission accomplishment. Use standard symbols as annotated in this chapter.

11.5.3.2. Although any appropriate media may be used, AF Form 4047, **Mission Flight Plan, AF Form 4048**, **Mission Flight Log**, or AF Form 4094, **Mission Flight Log - Continuation**, are recommended.

11.5.3.3. Required log entries:

11.5.3.3.1. Takeoff time and departure location.

11.5.3.3.2. All required general navigation and navigation leg positions, to include: the time, drift correction angle, compass heading or true heading, true airspeed, and groundspeed, and an ETA to the next significant waypoint along the route of flight.

11.5.3.3.3. Air refueling information, to include: receiver call sign(s) and tail number(s), the time and position for both the initial and final contacts, fuel transferred and number of wet/dry contacts.

11.5.3.3.4. Any significant events to include the time and location of occurrence.

11.5.3.3.5. Landing time, flight duration, and arrival location.

11.5.4. Navigation Charts:

11.5.4.1. Maintain an in-flight chart for all missions, which depart the airport traffic area. Use the chart to assist with in-flight navigation, provide a mission history and record significant events. Use standard symbols as annotated in **Figure 11.1.**

11.5.4.2. Required chart annotations:

11.5.4.2.1. Position symbol and time for all required general navigation and navigation leg positions.

11.5.4.2.2. Position symbol and time upon arrival at the ARCP or ARIP and A/R exit for an air refueling track.

11.5.4.2.3. Position symbol and time upon entry and exit from an air refueling anchor area.

11.5.4.2.4. Position symbol and time upon entry and exit from special-use airspace.

11.5.4.2.5. Position symbol and time when deviating from the planned route, due to weather avoidance or ATC vector.

11.5.4.2.6. Position symbol and time when returning to the planned route of flight.

11.5.4.2.7. Position symbol and time when general navigation fixing requirements terminate.

11.5.4.2.8. Course line and waypoints for ATC route of flight changes.

11.5.5. Log entries and fixing requirements may be delayed, postponed, or altered due to operational requirements or restrictions, unscheduled rendezvous, anchors, orbit delays, weather deviations requiring immediate action, EMCON limitations, or anytime such duties might interfere with safety of flight. Pacing is vital to ensure navigation accuracy. During periods when log entries are delayed, postponed or altered, make every effort to verify and crosscheck navigation systems.

11.5.6. Additional Requirements:

11.5.6.1. During departure and arrival, direct the aircraft using all appropriate aids to DR to ensure the aircraft remains on course. Should the pilots assume primary responsibility for departure or arrival navigation, continue to monitor aircraft navigation performance and advise the pilot team of any route of flight deviations. Be prepared to resume primary navigation responsibilities at any time.

11.5.6.1.1. 65AS -only. Navigators will use a terrain chart to monitor the aircraft position during all departures and arrivals. The terrain chart should be an ONC or larger scale chart.

11.5.6.2. Prior to takeoff complete a cockpit safety check. As a minimum, include the following: ATC route of flight IFR clearance, ATC takeoff clearance, weather (visibility, icing, thunderstorm activity, takeoff winds and wind shear), and flaps (set as briefed).

11.5.6.3. Prior to landing complete a cockpit safety check. As a minimum, include the following: weather (visibility, icing, thunderstorm activity, winds and wind shear), appropriate ATC approach and landing clearances, flaps (set as briefed), landing gear (down).

11.6. Navigation Leg (Nav Leg) Procedures. The nav leg is designed to exercise various navigation skills to successfully direct the aircraft from a designated "start nav" point to a designated "end nav" point within acceptable termination fix (end nav) accuracy requirements.

11.6.1. Maintain an in-flight mission flight plan log on any media. AF Form 4047, **Mission Flight Plan**, AF Form 4048, **Mission Flight Log,** or AF Form 4094, **Mission Flight Log Continuation**, are recommended.

11.6.2. Weather deviations, ARTCC restrictions, adverse tailwind components, etc., may create circumstances where minimum nav leg duration requirements (duration) cannot be met. Terminate the nav leg early (or late) and award credit if the minimum requirements are met. However, do not alter, shorten, or extend the nav leg for convenience or pacing difficulties.

11.6.3. Establish control time points (Control Timing Exercise), if required. Use alternate control time points and positions when in-flight re-planning, ARTCC restrictions, weather deviations or operational requirements prohibit reaching planned control time points.

11.6.4. Do not accomplish nav leg requirements; during climb out after takeoff, from 20 minutes before or 10 minutes after A/R rendezvous (up to and including initial receiver pre-contact and initial A/R contact), anchor A/R, descent before landing, IFR holding pattern, transition, or final landing phases of flight. Complete nav leg requirements, including checklist items, not later than 10 minutes before the anchor track entry point, IAF, initial point of a STAR, or planned starting point for an en-route descent.

11.6.5. Use a single, multiple, or averaged LOP to verify or update a DR position.

11.6.5.1. When using a calculator or computer to determine a celestial LOP, record the fix/MPP, time, body or bodies, assumed position, shot times, Zn, Hc, Ho and intercepts. On the celestial precomp, indicate if the calculator or computer adjusts the assumed position for Rhumb-Line, Coriolis, Precession, or Nutation, etc.

11.6.5.2. If a calculator or computer is used for NAVAID distance and bearing LOP information (including conversion to geographical coordinates), record the NAVAID identification, time, radial, distance and magnetic variation.

11.6.6. Compute celestial precomp information on any media. AF Form 4046, **Celestial Precomputation,** is recommended. Record all data used to obtain the celestial LOP. A calculator or computer may be used to crosscheck manually computed celestial precomp information. Ground celestial precomps are authorized; do not delay the mission for the sole purpose of using ground precomps.

11.6.7. Inflight, determine start and end nav leg points by any fix/MPP available. Base classification (day or night) of the nav leg, encompassing both day and night celestial activity, on the last fix/MPP obtained.

11.6.8. Initiate final heading alteration and announce final ETA before reaching termination (end nav) point. Revise and announce final ETA to accommodate changes in groundspeed.

11.6.8.1. Establish final position at the announced final ETA and before nav leg termination (end nav) fix. Aircraft heading may be altered after final DR position has been plotted to compensate for wind changes.

11.6.8.2. The nav leg is complete after the termination (end nav) fix is plotted. Do not alter or rework nav leg data after nav leg is terminated. Complete log or chart alterations and entries for clarification only; do not make log or chart alterations during penetration to final landing phase of flight.

11.6.9. DR Accuracy Standard. Compute and plot manual or automatic DR positions within 10 NMs from known or determined aircraft position (plotted and used on the chart). Apply standard to overall or total DR error for each fix/MPP and the nav leg termination (end nav) DR. The magnitude of the error is the distance in NMs between the navigator's plotted DR and the position monitor's fix, INS position, or the reconstructed DR; if radio aid, radar, or INS data, are not available.

11.6.10. Celestial Accuracy Standard. Compute and plot celestial LOPs within 10 NMs from known or determined aircraft position for all celestial LOPs used to determine aircraft position (plotted and used on the chart). Standard applies to each LOP used to meet nav leg requirements. The magnitude of the error is the distance in NM between the navigator's plotted LOP(s) and the position monitor's fix, INS position, or reconstructed DR if radio aid, radar, or INS data are not available. Do not use inaccurate HO (sextant readings) to determine celestial LOP accuracy standards. LOP errors of unknown origin, not related to extraction, computation, or plotting errors will not be considered an error.

11.7. GRID Navigation Procedures:

11.7.1. Steering by unslaved gyro (DG) is permitted on all missions. See high latitude A/R operation restrictions in **Chapter 15** of this AFI. Reference celestial observations, fixing, and plotting to GRID. Air Force GRID is the standard reference system when compasses are in DG mode.

11.7.2. If GRID navigation procedures are flown in conjunction with a nav leg, complete GRID entry checklist, including celestial heading check, not later than 10 minutes after start navigation fix/MPP. Accomplish GRID exit (checklist complete) within plus or minus 10 minutes of the termination fix/MPP unless continuing in GRID during general navigation.

11.7.3. During high latitude navigation, the aircrew will enter GRID before operating above 70 degrees North latitude or below 60 degrees South latitude IAW flight manual procedures unless operational constraints (i.e. high latitude A/R) limit accomplishment (N/A Cope Thunder operations).

When operating at high latitudes and GRID procedures are not used, the crew must consider the operating limitations of navigation and compass systems.

11.7.4. When steering by DG, accomplish a compass crosscheck after all heading changes of 20 degrees or greater. Above 60 degrees north or south, accomplish two true or GRID celestial heading checks each hour (approximately 30-minute intervals).

11.7.5. Compute and apply gyro precession during GRID operation.

11.7.6. Configure INS and DNS or INS/INS for GRID operation according to flight manual procedures.

11.8. Cell Formation Navigation Procedures. Cell lead is responsible for the navigation of the entire cell.

11.8.1. The primary responsibility of cell aircraft is station keeping. Cell aircraft, other than cell lead, should accomplish necessary navigation requirements to assume lead should the necessity arise.

11.8.2. Navigation coordination between aircraft within formation cell is encouraged unless operational (EMCON) restrictions or A/R requirements limit communication. Do not jeopardize cell tactics or integrity for this purpose. However, if cell aircraft detects a known navigation error, inform cell lead immediately.

11.8.3. Credit nav leg training requirements to all cell aircraft provided each aircraft met the minimum requirements for the type of nav leg. Do not jeopardize cell tactics or integrity, i.e. alter cell formation to meet terminal CE or cause large airspeed changes to meet Control Time Exercise timing, when attempting to obtain nav leg credit.

11.9. Air Traffic Rules.

11.9.1. This section provides guidance for aircrews operating worldwide. See chapter 6 of the FLIP General Planning, the Foreign Clearance Guide, FAA Handbook 7610.4H, and AFI 11-202 Volume 3 for additional requirements or restrictions.

11.9.2. General Navigation. Unless authorized by the controlling agency, aircraft operating in controlled airspace under IFR on all routes published or unpublished, must fly along a direct course between NAVAIDs or fixes defining the route (AFI 11-202 Volume 3). Deviations will only be approved by the controlling agency or when operating in special-use airspace or on Military Training Routes (MTRs).

11.9.3. Nav Leg-CONUS. Aircrews may deviate from centerline under the following provisions; obtain clearance for "celestial navigation" from ATC agency, have an operating IFF, transponder. Advise ATC agency before initiating a heading change greater than 20 degrees and when terminating celestial navigation. The aircraft will remain within 30 NMs of course unless otherwise authorized.

11.9.4. Nav Leg-Outside CONUS. Comply with the Foreign Clearance Guide and appropriate FLIP AP for course restrictions and clearance requirements. INS-autopilot steering is authorized. Several countries have air traffic control agency provisions to conduct nav leg (celestial) training, i.e. United Kingdom “non-deviating status for astro-navigational training."

11.10. Minimum Navigation Performance Specification (MNPS) Operations. Operations within the North Atlantic area's MNPS airspace, Canadian minimum navigation performance specifications

(CMNPS), or selected Pacific routes are designed for INS-autopilot coupled operation. (See FLIP AP/2, chapter 5, and AFI 11-202 Volume 3.) When not engaged in A/R operations, aircrews will adhere to this procedure.

11.10.1. The C/KC-135 single Delco IV Inertial Navigation System with a qualified navigator or qualified NSO with ARP-modified aircraft meet MNPS accuracy requirements for operation in the North Atlantic Track (NAT) region. Navigation responsibility should focus on the successful operation, routine monitoring, validation, and accurate update of the INS navigation system. Malfunctioning equipment that reduces the aircrew's capability to comply with MNPS, whether occurring prior to or within MNPS airspace, will immediately report the malfunction to the controlling agency and subsequent agencies throughout the route of flight. Prior to airspace entry, aircrews will return to the nearest maintenance repair facility unless the aircraft has as a minimum: operable dual INS or a qualified navigator with an operable single INS. Dual INS aircraft with a qualified navigator that lose one INS prior to airspace entry may continue. Aircraft losing INS capability may continue unless directed by controlling agency (in order to permit necessary adjustment to separation standards).

When flying in MNPS airspace, exercise special caution to ensure the coordinates of the assigned track and associated landfall and domestic routings are fully understood and correctly inserted into the automatic DR navigation system with appropriate cross-checks. If at any time the route (re-routing, if appropriate) is in doubt, check the details with ARTCC facility.

11.11. Dual INS (Avionics Relocation Program [ARP]) with GPS or INS/DNS with GPS Procedures. For missions across oceanic airspace, celestial procedures may not be required if all automatic DR systems are operational. Applies to 65 AS when flying in Category I airspace.

11.11.1. Prior to flight, plot the oceanic portion of the flight on an appropriate chart. Annotate the chart with the mission number, AC's name, preparer's name, and date. If practical, the chart may be reused.

11.11.2. Check both the coordinate information and the distances between waypoints against the flight plan.

11.11.3. In-Flight, use all available NAVaids to monitor INS performance. Immediately report malfunctions or any loss of navigation capability, which degrades centerline accuracy to the controlling ARTCC. Use the following procedures for flight progress:

11.11.3.1. Obtain initial level off or coast-out fix (radar or NAVAID) before or immediately on entering the Category I Route/Over-water segment. Steering may be through INS-autopilot tie-in except when conducting A/R.

11.11.3.2. At intervals not to exceed 30 minutes compare present position coordinates for each INS or INS/DNS and MAJCOM approved GPS from coast-out until coast-in fix.

11.11.3.3. If a revised clearance is received, record and plot the new route of flight on the chart.

11.11.4. Procedures. Evaluate each navigation systems' performance. Use historical drift rate data to help determine MPP. Log the position and time on the chart and in-flight log.

11.11.4.1. Monitor and crosscheck aircraft heading systems. Log heading and time and deviation rate (if appropriate) on the chart or in-flight log. The INS or MAJCOM-approved GPS heading information may satisfy requirement.

11.11.4.2. Monitor and ensure compliance with course and ETA requirements.

11.11.5. Should one or both INS units become inoperative or INS positions noticeably separate and exceed 10 NMs, determine the most accurate navigation system using all available NAVAIDs (i.e. MAJCOM-approved GPS). Transition to single INS procedures (Category I/Over-water nav leg) if unable to determine and correct navigation system error or malfunction. For INS/DNS equipped-aircraft if the INS and GPS positions exceed 10 NMs, all available NAVAIDs (to include celestial) will be used to determine the aircraft's actual position.

11.11.6. Maximum terminal fix (coast-in point) - 15 NMs*.

NOTE: *MNPS navigation accuracy standard is 6.3 NMs along two designated geographical coordinates for a significant percentage of the missions flown on the route. Aircraft exceeding the maximum value of 24 NMs is considered "gross navigation." 15 NMs circular error represents the standard for successful nav leg training and qualification requirements only.

11.12. Inoperative INS Units.

11.12.1. One unit inoperative:

11.12.2. Advise ARTCC unless within range of normal radio aids.
Plot position on navigation chart every 30 minutes.
Check the accuracy of remaining INS, using all available NAVAIDs (VOR/DME, GPS, and radar).

11.12.3. Two units inoperative:
Advise ARTCC.
Crosscheck compass system heading with mission plan at waypoint or every 30 minutes.
Verify last recorded position on chart.
Use computer flight plan as guide.
Use ADF, VOR/DME, radar to update the DR positions.
If desired and other methods fail, try to obtain a HF DF fix. This service can be requested through the regular ARTCC frequencies.

11.12.4. Differences Between INS:

11.12.4.1. 10-20 NMs:
Plot both positions every 30 minutes.
Monitor, check position using available ground aids.
Attempt to establish which INS is most accurate. If unable to determine which set is in error, split the difference.

11.12.4.2. 20-40 NMs:
Plot both positions every 30 minutes.
Check position using available ground aids.
Check groundspeed (this may be a good indication of a faulty INS).
Attempt to establish which INS is most accurate. If unable to determine which set is in error, split the difference.

11.12.4.3. Over 40 NMs:

11.12.4.3.1. If divergence has been gradual, it should have been determined which INS is accurate, then follow one unit inoperative procedure. If divergence has been sudden, check groundspeed function, as abnormal readouts would indicate a faulty INS.

11.12.4.3.2. Determine which INS is correct by checking available ground NAVAIDs and which INS has been following the flight plan most closely, then use it as primary.

11.12.4.3.3. If the CFP has been in error prior to detecting divergence, update the flight plan using data found.

11.12.4.3.4. If unable to determine which INS unit is in error, follow two units inoperative procedure.

11.13. Radar Usage. Configure the radar based on mission requirements. To help extend the service life and minimize unnecessary radar emissions, the radar may be operated in standby when not required for fixing, i.e. Category I Route/Over-water or unlimited visibility. Conduct airborne radar-directed approach procedures IAW flight manual and **Chapter 9** of this AFI.

11.14. Low-Altitude (LA) Operations.

11.14.1. C/KC-135s do not normally conduct training or operational sorties (except traffic pattern activity at airspeeds less than 250 KIAS) in the altitude environment below 10,000 to 3,000 ft AGL. Do not conduct operations (low-level [LL]) below 3,000 feet AGL. Low-altitude air refueling (LAAR) requirements are in **Chapter 15** of this AFI. In the event flight operations in the 10,000 to 3,000 feet AGL environment are planned (i.e. ferry flight for cracked window restricting flight to below 10,000 feet), adhere AFI 11-202, Volume 3 and the following requirements:

11.14.2. Planning:

11.14.2.1. Design routes to place the aircraft at an altitude consistent with mission requirements while maximizing flight safety. Designate a point described by geographical coordinates as the low-altitude entry point (LAEP) and establish an IFR altitude for the LAEP. Define additional LA route points (maximum 100 NMs between each point) by geographical coordinates. Refer LA routing between points as LA route segment. Categorize each LA route segment as mountainous or non-mountainous separately and determine an IFR altitude for each LA route segment.

11.14.2.1.1. Mountainous terrain. Land features varying more than 1,000 feet in elevation within 10 NMs of the planned course centerline for that route segment. Compute IFR altitude as 3,000 feet from the highest obstruction or terrain within 10 NMs.

11.14.2.1.2. Non-mountainous terrain. Land features (over-water) not within mountainous terrain category. Compute IFR altitude as 3,000 feet from the highest obstruction or terrain within 4 NM of planned course centerline up to maximum of 10,000 feet AGL.

11.14.2.2. Plan LA speeds at 240 knots indicated airspeed (KIAS) or best endurance to minimize the bird strike hazard. At no time during LA will in-flight speed exceed 300 KIAS.

11.14.2.3. The threat of bird strikes present a significant hazard during LA operations. Planners should consider areas of known bird concentrations such as migratory flyways, roosting areas, etc. Crews observing hazardous low level bird activity should report the bird sighting to planners during mission debriefing.

11.14.2.4. Ensure fight plan depicts the LA route-of-flight on an appropriate scale navigation chart with sufficient detail for in-flight use and monitoring (normally TPC).

11.14.3. Hazardous Weather and Flight Restrictions:

11.14.3.1. Conduct all flights in daylight, VFR conditions unless the mission is planned and operating on an IFR clearance in controlled airspace or a published IR route at IFR altitude. When operating on a published domestic IR route, below the IFR altitude, and VFR conditions cannot be maintained, climb to the IFR altitude before IFR conditions. When entering LA, crews must be able to visually clear the terrain at the LAEP.

11.14.3.2. Do not conduct LA operations in areas of forecast severe icing conditions or in area of reported moderate or severe icing conditions. If moderate or severe icing conditions are encountered, consider the condition an emergency. Flight plan deviate or exit the route as soon as possible.

11.14.3.3. Do not conduct LA operations in areas of forecast severe turbulence, forecast moderate or greater turbulence in mountain wave effect, or reported moderate or greater turbulence. If moderate or greater turbulence is encountered, consider the condition an emergency. Flight plan deviate or exit the route as soon as possible.

11.14.3.4. When forecast surface winds over any segment of the route exceed 40 knots, crews may encounter wind gust factors that may exceed aircraft structural limits. When approaching a route segment with in-flight winds exceeding 40 knots, it is advisable to climb on course if light turbulence is encountered. Structural limits are critical when gust factors (sudden ground speed changes, rapid drift changes normally associated with turbulence) exceed 27 knots. If such encounters are experienced, consider it an emergency. Flight plan deviate or exit the route as soon as possible.

11.14.3.5. Use all available information (i.e. wind readouts, drift information, blowing dust, turbulence, cloud formations, etc.) to evaluate the possibility of encountering hazardous weather conditions. Use the cockpit MA1 accelerometer to determine the severity of climatological events. If G limit readings fluctuate lower than 0.6G or higher than 1.4G (excursions exceed +/- 0.4G) several times per minute, slow to turbulence penetration airspeed. (See appropriate flight manual subject: Turbulence Airspeed.) Flight plan deviate or exit the route as soon as possible.

11.14.4. Adhere to planned route-of-flight. Flight plan deviations should be made under VFR conditions only. Altitude clearance and crew position awareness is critical. If a flight plan deviation is required, maintain IFR altitude for the LA route segment and remain with corridor airspace as defined as mountainous or non-mountainous. Return to planned route-of-flight as soon as possible.

11.14.5. Crews will obtain the latest weather information. Obtain altimeter settings for the entire planned LA route-of-flight. Before LAEP, contact appropriate metro service and update forecast weather. Attempt to obtain up-to-date altimeter settings for each LA route segment.

11.14.6. Additional Considerations:

11.14.6.1. During LA operations, occupants in unshielded forward facing positions (pilot, copilot, and jump seat occupant) should wear helmets with visors down for protection against bird strikes. The potential of a moderate sized object penetrating the pilot number 1 and copilot number 1 windows is significantly increased at airspeeds in excess of 250 KIAS. Use a boom mike to facilitate cross-cockpit communications.

11.14.6.2. Aircraft commander may terminate LA operations for fatigue or other reason deemed appropriate. LA route study emphasizing altitude requirements, in-flight plan deviations, and abort procedures are mandatory. Enter duration, airspeed and any moderate or greater turbulence encountered during LA operation in the aircraft AFTO 781, **AFORM /aircrew/Mission Flight Data Document**. Submit AFTO Form 76, **C/KC-135 Aircraft Structural Assessment Data (OCR)**, after each LA flight according to T.O. 1-135-38.

11.15. Nav Legs - Description. May be flown day or night, heading reference magnetic or grid.

11.15.1. Mission Nav Leg. Designed to exercise the on-board navigation system capabilities normally employed in day-to-day flight operations.

11.15.1.1. Minimum duration - 1 hour.

11.15.1.2. Minimum accomplishments:
Designate a start and end navigation points (waypoints).Two fixes or MPPs after the start nav point with no more than 30 minutes between each fix/MPP.
Three celestial LOPs (observe and plot for credit).
One radar fix (distance and bearing).
One TACAN MIX update. If TACAN information is not available, complete one radar present position update.
One NAVAID fix (if available).
One celestial heading check, compute compass deviation.

11.15.1.3. Procedures: Steering may be through INS-autopilot tie-in except when conducting A/R. If a known navigation system malfunction occurs, assess available navigation information, transition to available information (including manual DR, if required), to successfully meet accuracy standards.

11.15.1.4. Authorized aids - All navigation systems.

11.15.1.5. Maximum allowable terminal fix circular error - 10 NMs.

11.15.2. Category I Route/Over-water-Single INS/No GPS (dual INS as required). Designed to exercise and meet the on-board navigation system capabilities in a strategic International Civil Aviation Organization (ICAO) environment.

11.15.2.1. Minimum duration - 1 hour.

11.15.2.2. Minimum accomplishments:

11.15.2.2.1. Designate start and end nav points (normally coast-out and coast-in) before or immediately upon entering the Category I Route-Over-water segment if routing is received in-flight.

11.15.2.2.2. Two fixes or MPPs from initial level off or coast-out to coast-in with no more than 50 minutes between fix/MPPs.

11.15.2.2.3. 5 minutes after passing each oceanic waypoint (reporting point), record and plot latitude and longitude (unaided) present position coordinates for each INS (not required if carrying manual DR).

11.15.2.2.4. Take the final fix/MPP not earlier than 20 minutes or not later than 10 minutes from the navigator's ETA to control points or ADIZ penetration position.

11.15.2.2.5. 6 celestial LOPs (observed and plotted for credit). Evaluate resulting fix/MPP with each automatic DR position.

11.15.2.2.6. 1 celestial heading check per hour starting at initial level off point or coast-out fix/MPP.

11.15.2.3. Authorized aids - All navigation systems.

11.15.2.4. Procedures - Steering may be through INS-autopilot tie-in except when conducting A/R. For each fix/MPP, use each type of navigation information (radar, celestial, NAVAID) to verify and update the automatic DR position in any mode of operation. If a known navigation system malfunction occurs, assess available navigation information, transition to available information (including manual DR, if required), to successfully meet accuracy standards. Substitutable for mission nav leg if minimum accomplishments are complete.

11.15.2.5. Maximum terminal fix circular error (coast-in point) - 15 NMs*.

NOTE: *MNPS navigation accuracy standard is 6.3 NMs along two designated geographical coordinates for a significant percentage of the missions flown on the route. Aircraft exceeding the maximum value of 24 NMs is considered "gross navigation." 15 NMs circular error represents the standard for successful nav leg training and qualification requirements only.

11.15.3. Tactical Nav Leg . Designed to exercise the on-board navigation system capabilities for employment in a theater environment where tactical considerations and aircraft survivability require operations with minimum aircraft emissions.

11.15.3.1. Minimum duration - 1 hour.

11.15.3.2. Minimum accomplishments - Four radar fixes not including the entry fix.

11.15.3.3. Authorized aids - all aids are authorized except radio aids. Operate the APN-218 Doppler-OFF, DNS may operate in true airspeed submode, simulating EMCON navigation equipment limitations.

11.15.3.4. Procedures - Obtain and plot radar fixes not more than 15 minutes apart and immediately following major turn points exceeding 45 degrees. Maintain the radar in "standby" mode. Turn to "operate" for periods not to exceed 1 minute for each fix, returning to the "standby" mode (simulating limited radiation of radar emissions).

11.15.3.5. Accuracy standards - Resolve radar fixes within an accuracy of 5 NMs.

11.15.3.6. Maximum allowable terminal fix circular error - 10 NMs.

11.15.4. Degraded Equipment Nav Leg . Designed to exercise basic navigation procedures in an in-flight environment and simulate extensive automatic DR navigation system failure.

11.15.4.1. Minimum duration - 1 hour.

11.15.4.2. Minimum accomplishments:

11.15.4.2.1. Designate a start and end nav points.

11.15.4.2.2. Six LOPs (observe and plot for credit).

11.15.4.2.3. Two fixes or MPPs.

11.15.4.2.4. Two celestial heading checks (excluding **GRID** entry and exit).

11.15.4.2.5. Compute and plot manual DR.

11.15.4.3. Authorized aids - All aids are authorized except radio aids, radar, INS, DNS, and MAJCOM approved GPS.

11.15.4.4. Procedures - Place the INS data selector, at the navigator's position, in desired track/system status (DSRTK/STS) position. Crews should obtain celestial navigation clearance.

11.15.4.5. Maximum allowable terminal fix circular error - 20 NMs.

11.16. Control Time and Position Exercise. Designed for the navigator and crew to exercise precise timing control to a defined position. May be accomplished throughout the mission excluding take-off, transition, and landing.

11.16.1. Minimum duration - 30 minutes.

11.16.2. Minimum accomplishments - Two log entries for each control time and position exercise.

11.16.3. Procedures. Plan or designate one or more specific navigation points along a planned or re-planned route as "control time points (CTP)." Coordinate the ETA to CTPs with the scoring officer not later than 30 minutes before the proposed ETA. Compute, monitor, and update the required groundspeed and headings to be overhead the designated CTP at the proposed ETA.

11.16.4. Authorized Aids. Use all NAVAIDs during general navigation. If accomplished during a nav leg training, see the appropriate authorized aids.

11.16.5. Accuracy standards - ETA ± 30 seconds. Maintain planned course within 10 NMs at all time.

11.16.6. Maximum allowable circular error - 5 NMs.

11.17. Monitoring Nav Leg Requirements. The crew is responsible for monitoring aircraft position, observing air traffic control requirements, providing position reports, and ensuring safety-of-flight. Crew coordination and mission pacing are essential.

11.17.1. The aircraft commander will designate a crewmember, other than the primary navigator, as aircraft position monitor.

11.17.2. The flight crew will crosscheck ARTCC flight plans (DD Form 175, **Flight Plan**, or DD Form 1801, **DoD International Flight Plan**) with mission flight plan to ensure accuracy.

11.17.3. Before flight, plot the nav leg portion of the flight on an appropriate chart (e.g. TPC, ONC, JNC or GNC). Annotate the chart with the mission number, aircraft position monitor's name and date. Reuse charts if practical.

11.17.4. The aircraft position monitor (normally the copilot position) will obtain and record precision fix or automatic DR present position information on the navigation report.

11.17.5. Monitor each nav leg for fix/MPP, corridor, and terminal CE requirements. Alter the aircraft heading as necessary to avoid special use airspace and remain within appropriate ARTCC protected

airspace. Request additional ARTCC corridor clearance if required. The crew will coordinate aircraft heading changes and specific fix/MPP pacing requirements during the nav leg.

11.17.6. Use all existing navigation aids to monitor the aircraft position. The following aids are available:

11.17.6.1. Radar video recorder, (aircraft so equipped).

11.17.6.2. Precision fix (multiple-radio bearing, TACAN, radar, MAJCOM approved GPS position).

11.17.6.3. TACAN-aided INS or DNS.

11.17.6.4. Automatic DR (INS, INS/INS, or MAJCOM-approved GPS present positions coordinates) or crosstrack function.

11.17.6.5. Strategic training range plot.

11.17.7. Procedures. Record and plot a precision fix* at start nav and end nav (final ETA) positions at the coordinated time, each additional designated fix/MPP time, and after roll out for turns exceeding 20 degrees. ***NOTE:*** Precision fix is a TACAN/VOR bearing and DME, two or more VOR bearings, or radar range and bearing plotted and logged in the navigation report. Use automatic DR (INS, INS/INS, MAJCOM-approved GPS) present position coordinates if two dimensional fix information is not available.

11.17.8. Re-routed nav legs due to weather, ARTCC vectors, etc., corridor monitoring will reflect new routing from the time and position the clearance is given. Redraw new routing on the appropriate chart.

11.18. Reconstructing, Scoring, and Review (RSR) - Nav Leg Requirements.

11.18.1. Local units determine RSR requirements. Activities include assigning, reviewing, filing, and determining corrective action, if appropriate. As a minimum, include the following; navigator qualification evaluations, MAJCOM or NAF (ASEV, etc.) evaluations, and suspected navigational incident Category I/Over-water missions.

11.18.2. Reconstruct nav legs using the navigator's in-flight log, chart, celestial data, navigation report, position monitor chart, and any additional supporting documentation. Legible photocopies of the charts are sufficient.

11.18.3. Procedures. On the navigator's chart, reconstruct all aircraft position monitor precision fix information on the navigation training report. Compute solutions for all celestial observations and replot all lines of position (LOP). Circle errors and record and plot correct information.

11.18.4. Score each fix/MPP for appropriate DR and celestial accuracy standards. Score circular error by measuring the distance from the reconstructed end nav position and the position monitor's end nav precision fix at the final ETA.

11.18.5. Review and summarize the nav leg overall performance. Debrief the navigator on replot results before flying the next nav leg, but in no case later than 10 duty days after the mission or as determined by local units. ANG and USAFR units will complete the debrief not later than the next UTA following assignment of the RSR.

11.19. AF Form 4045, Navigation Report.

11.19.1. General Information (complete by appropriate crewmember). Use two forms if accomplishing a nav leg by two navigators (augmented crew) on the same mission.

11.19.1.1. Blocks 1-8 - Identification Information . Self-explanatory.

11.19.1.2. Block 9 - Sextant Correction . Enter the computed sextant correction factors) as it applies to the Hc.

11.19.1.3. Blocks 10-12 - Navigation Category Information . Self-explanatory.

11.19.2. Position Accuracy Data (complete by aircraft position monitor):

11.19.2.1. Block 13 - Position Accuracy Data . See paragraph 15 requirements (completed by the aircraft position monitor).

11.19.2.2. Block 14 - Termination Fix . Compute NMs; distance from planned or re-planned end nav point to end nav terminal fix time.

11.19.3. Control Time and Position Accuracy Data (completed by aircraft position monitor):

11.19.3.1. Block 15 . Desired position and time (normally filled in during mission planning).

11.19.3.2. Block 16 . Use when a second control time exercise is used on the same mission.

11.19.4. Computation, Plotting Error, and Navigation Accuracy Standard Summary (complete by RSR officer):

11.19.4.1. Block 17 . Record each position time used by the navigator to determine fix/MPP.

11.19.4.2. Block 18 - LOP Number . Enter a number for each celestial and radio aid bearing or distance in the sequence they were taken.

11.19.4.3. Block 19 - Precomp Error (celestial observation only). An error resulting from incorrect information on the precomp, i.e. wrong LHA, addition or subtraction errors, motion errors, azimuth, etc. Include suspect errors, e.g. observation, acceleration and wander error.

11.19.4.4. Block 20 - Plotting Error . An error caused by incorrect celestial information on the chart, i.e. LOP plotted incorrectly, either intercept or azimuth plotted in error, erroneous assumed position, DR, etc. Include NAVAID plotting error.

11.19.4.5. Block 21 - Other Error . As required, describe error in remarks. Reference to position number and time.

11.19.4.6. Block 22 - LOP Error . Enter the total error value for each LOP used to determine the fix/MPP. If average information, use the outline block.

11.19.4.7. Block 23 - DR Error . Enter the total value for each fix/MPP. Include erroneous drift, groundspeed, time, elapsed time, or failure to properly use or compute compass deviation or gyro precession as the error effects the DR.

11.19.4.8. Block 24 - Fix/MPP Error . Enter the difference, in NMs, measured from the navigator's fix/MPP to the RSR determined fix/MPP. Do not include computation error points.

11.19.4.9. Block 25 - Circular Error . Complete by the RSR officer. Self-explanatory.

11.19.4.10. Block 26 - Reconstruction Difference . Complete by the RSR officer. Self-explanatory.

11.19.4.11. Block 27 - Summary . Apply DR and LOP accuracy standards (paragraph 6) to blocks 23 and 24 for each position. Apply termination fix or circular error requirement (see type nav leg in paragraph 12) based on type of nav leg flown (block 10). Critique all errors. RSR will make an overall recommendation and check the appropriate box. For evaluations and qualification requirements, apply appropriate evaluation criteria and determine overall qualification; "successful" equals Q, "need training" equals Q-, and "re-accomplish" equals Q3.

11.19.4.12. Block 28 - Remarks . Self-explanatory.

11.19.4.13. Block 29-32 - Signatures . Self-explanatory.

11.19.5. Additional Considerations:

11.19.5.1. An error affecting one LOP only is considered as one error, even when the LOP is subsequently averaged with other LOPs, i.e. a math error in computing an intercept, motion error affecting only one LOP. Determine the magnitude of the error by comparing the correct intercept with the erroneous intercept values for that single LOP, not the effect on the average LOP.

11.19.5.2. Award no more than one overall DR error for each fix/MPP position. The magnitude of the error is the distance in NM between the navigator's DR and the reconstructed DR. Do not score DR positions used only to determine assumed position.

11.19.5.3. Azimuth errors are considered as plotting errors.

Figure 11.1. Navigation Log and Chart Symbology.

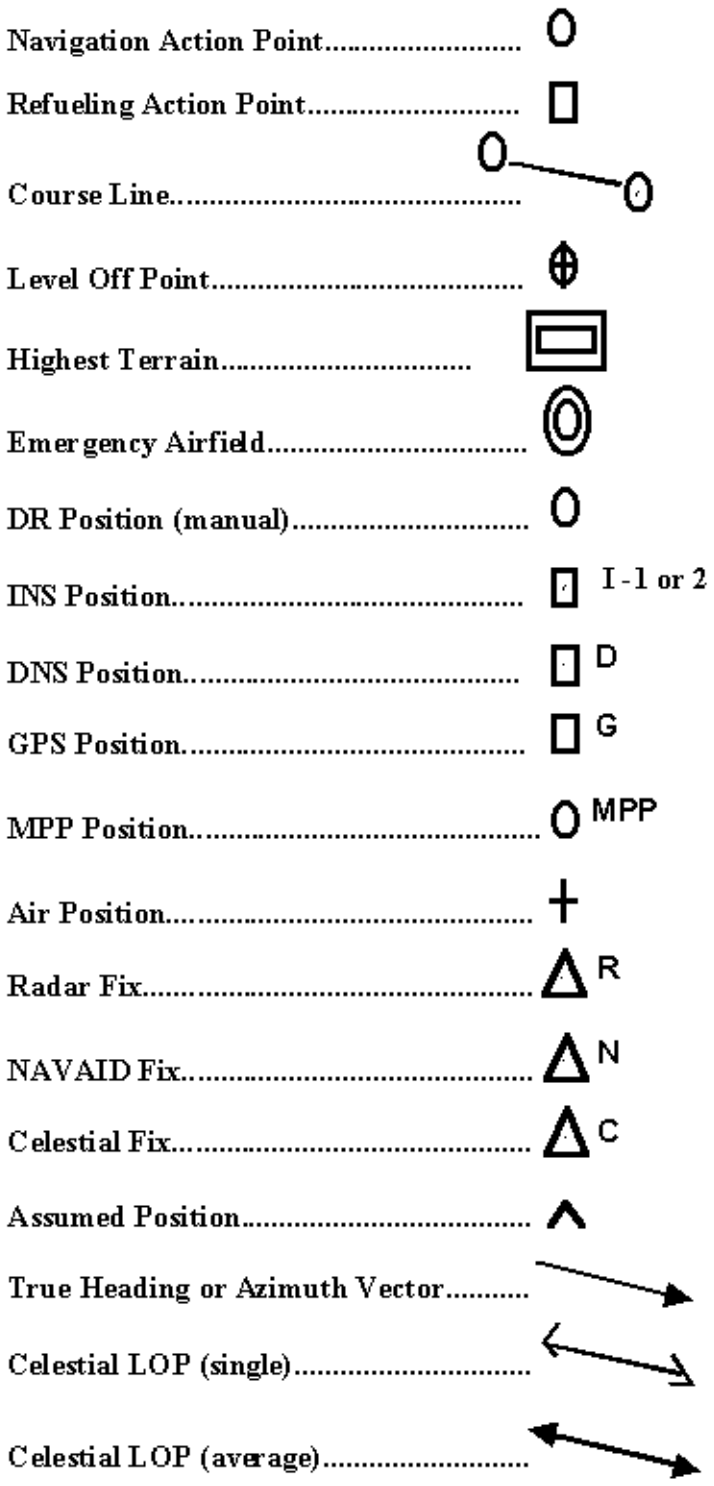
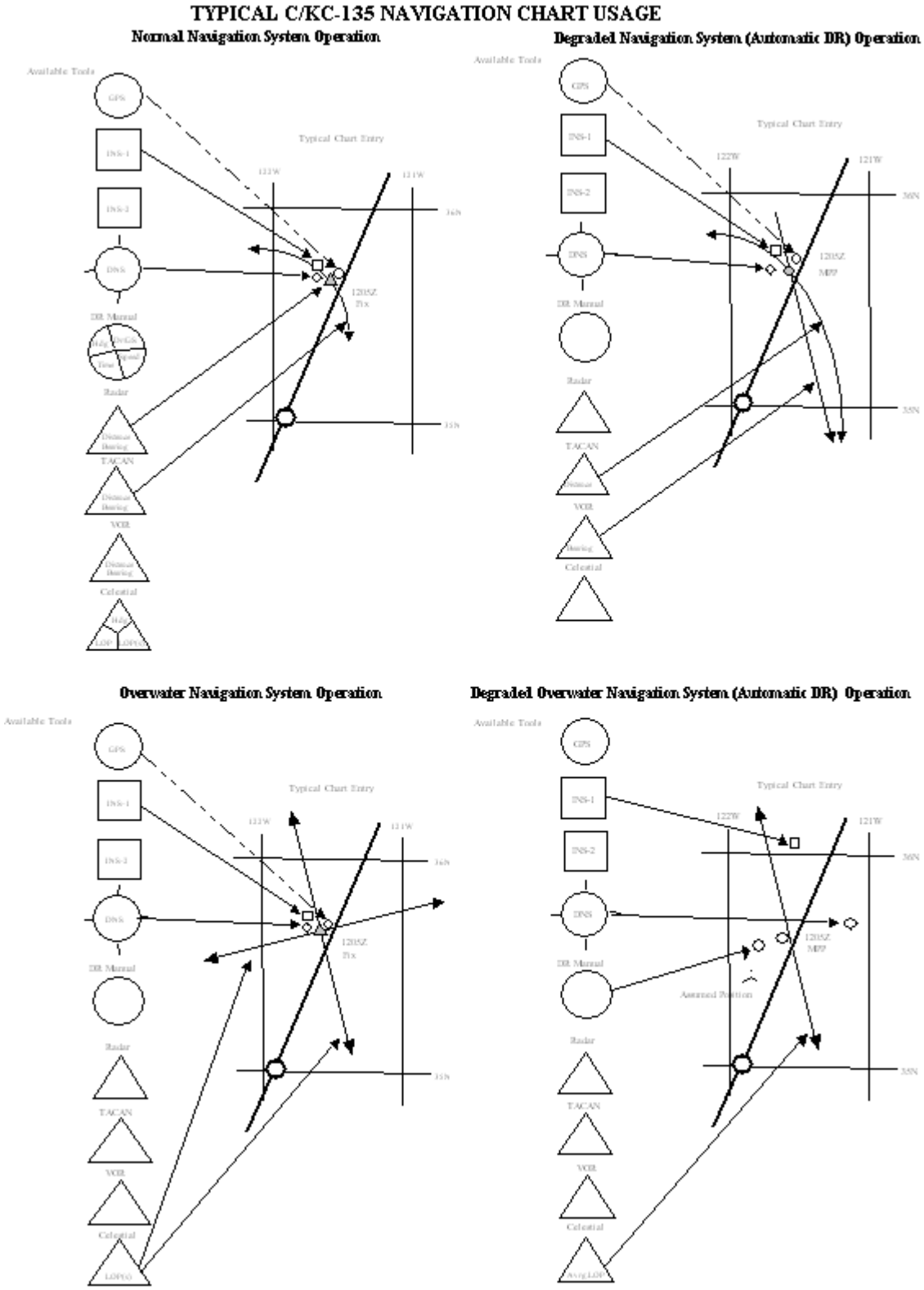


Figure 11.2. Typical Navigation Chart Usage.



NOTES:

1.Use automatic DR for normal day-to-day operation, verify with accurate (two-dimensional) fixing. Update equipment, as required.

2.Transition to appropriate navigation system (available tools), based on equipment performance, capabilities, and tolerances.

3.When automatic DR sources become inaccurate, transition to manual computed DR and update navigation equipment.

4.When exceeding the range of ground-based fixing (radar, NAVAID) transition to appropriate navigation system (INS or celestial).

Figure 11.3. Sample--AF Form 4045, Navigation Report (Front).

NAVIGATION REPORT

1. NAVIGATOR OR NI (Name, Grade)	2. NAVIGATOR 2 (Name, Grade)	3. POSITION MONITOR (Name)	4. CELESTIAL OBSERVATDNG) (Name
WHORLEY, J. Capt		HARRIS, M. Maj	PRATT, D. MSgt
5. DATE FLOWN (Zulu Date)	**6. OG/SQUADRON**	**7. RSR OFFICER (Name)**	**8. AIRCRAFT TAIL NUMBER**
19 Nov 97	319/906	SMITH, C. 1LT	58-3450

9. SEXTANT CORRECTDN 1 2	10. TYPE NAV LEG (Check One)	11. AREA OF OPERATIONS (Check One	12. DR METHOD
Ground Check 3 ___ NM ___ NM Air Check ___ NM ___ NM	X Mission ___ Cal I/O verwater ___ Tactical ___ Other (Specify) ___ GRD	X CONUS ___ PACIFIC ___ EUROPE ___ Other (Specify) ___ ALASKA	Manual DR X Automatic DR Other (Specify)

I. NAVIGATION - POSITION ACCURACY DATA (Completed by Aircraft Position Monitor)

13. POSITION (Time, -ID, Radial & DME, INS coordinates if radio aid not available, -NM Left or Right of Course, -Remarks on Reverse, if Required)

ST NAV	1800 Z	LMT154025	0 NM	N41-47 W121-30	7	Z		NM	
2	1820 Z	REL076046	2L NM	CEL FIX	8	Z		NM	
3	1835 Z	SAC074047	4L NM	N38-40 W120-34	9	Z		NM	
4	1837 Z	SAC075070	5R NM	N38-42 W120-06	10	Z		NM	
5	1850 Z	Not available	8R NM	VORTAC FIX	11	Z		NM	
6	Z		NM		END NAV	1900 Z	HZN104071	12R NM	N39-14 W117-32

14. TERMINATION FIX 9 NM (Distance from planned/replanned end NAV point to the terminal fix)

II. CONTROL TIME/POSITION ACCURACY DATA (Complete by Aircraft Position Monitor)

15. DESIRED POSITION	DESIRED TIME	ACTUAL POSITION	ACTUAL TIME	CIRCULAR ERROR
OAL 254058	2105 Z	OAL 254056	2105 Z	8 NM
16. DESIRED POSITION	**DESIRED TIME**	**ACTUAL POSITION**	**ACTUAL TIME**	**CIRCULAR ERROR**
	Z		Z	NM

III. COMPUTATION, PLOTTING ERROR, AND NAVIGATION ACCURACY STANDARD SUMMARY (Completed by Replot Officer)

17. TIME	Position #1		Z	Position #2		Z	Position #3		Z	Position #4		Z	Position #5		Z
18. LOP NUMBER	1	2	3	radar	Rng	Brg	Ten	Rng	Brg						
19. PRECOMP ERROR	30														
20. PLOTTING ERROR		4													
21. OTHER ERROR															
22. LOP ERROR		Average 15			Average			Average			Average			Average	
23. DR ERROR			NM			NM			NM			NM			NM
24. FIX/MPP ERROR		16	NM		4	NM		3	NM			NM			NM

25. CIRCULAR ERROR Distance from reconstructed final position to planned or replanned End Nav Point	26. REDONSTRUCTION DIFFERENCE Distance between reconstructed final position and terminal fix (End Nav Fix)	27. SUMMARY (Check One)
3.5 NM	4.0 NM	☐ Successful ☐ Need TNG ☐ Reaccomplish

28. REMARKS (Use reverse, if required)

1820Z Day celestial position: Single body (Sun), three--30 second shots, with 2--early, on-time, 2--late pacing. LOP #1 motions computed 30 NM in error (read minus 15, actual plus 15 on celestial precomp computer) with no crosscheck. MPP favored INS & DNS positions (ignoring celestial data). Did not update DNS position to MPP (DNS 7.5 NM from designated MPP).
1835Z Radar Fix (follow-on 90-degree left turn). Single target at 47 NM range. Radar hdg marker set -3 degrees from ture hdg.
1850Z VORTAC Fix. Applied wrong mag. var. (16E actual 18E) to bearing.
OVERALL: Fair results however, attention to detail on celestial data preparation, radar operation, and fixing accuracy required.

IV. VALIDATION

29. SIGNATURE (Aircraft Position Monitor)	DATE	COMMENTS
	19 Nov 97	Unable to log 1850Z position due to crew duties (ARTCC traffic avoidance call) see nav chart.
30. SIGNATURE (RSR Office)	DATE (After Critique) 20 Nov 97	COMMENTS Recommend 1 CTD with instructor to fine tune cel. and 1 inflight instr ride to reaccomplish leg.
31. SIGNATURE (Navigator, After Critique	DATE (After Critique) 20 Nov 97	COMMENTS
32. SIGNATURE (Navigator 2, After Critique	DATE (After Critique)	COMMENTS
33. SIGNATURE (Reviewing Officer)	DATE 21 Nov 97	MINIMUM REQUIREMENTS MET (Check One) ☐ YES ☒ NO

Figure 11.4. Sample--AF Form 4045, Navigation Report (Back).

Reviewing Officers Comments:

Overall, mission nav leg is unsuccessful. Complete two 1 hour CTDs and successfully complete an inflight mission nav leg under supervision of an instructor. CTD will concentrate on manual precomp preparation emphasizing motion adjustments. Demonstrate proficiency inflight including radar equipment setup and magnetic variation application. Complete CTD before inflight training.

Chapter 12

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12.1. This chapter not used for KC-135 operations.

Chapter 13

BOOM OPERATOR PROCEDURES

13.1. General. The primary duty of the boom operator is to conduct A/R operations [For Pacer CRAG 3-Person operations the primary duties of the boom operator are to ensure the pilots comply with all altitude clearances and briefed approach procedures (except when their duties require their presence outside the crew compartment) and conduct A/R operations]. For MPRS, the primary duties of the boom operator are to conduct A/R Pod operations to include, but not limited to, management of receiver flow from pre-contact to final disconnect, transfer of fuel offload, and Pod Control Panels(s) system status for normal and/or abnormal operation(s). Specific A/R instructions and procedures are in **Chapter 17** of this AFI. Other duties include load planning, coordinating loading and unloading operations, supervising on loading and off-loading of passengers and cargo, and providing in-flight assistance to passengers.

13.2. Responsibilities for Aircraft Loading.

13.2.1. AMC Stations.

13.2.1.1. Air freight personnel are responsible for selecting cargo and mail for airlift, promptly completing documentation, palletizing cargo, load planning, computing load distribution, and movement of cargo to and from the aircraft to meet scheduled departure. They will advise the boom operator of destination, size, weight, and type of cargo (classified, hazardous, etc.) before starting load operation to permit proper positioning. They will also coordinate traffic activities that may affect loading and off-loading and assign sufficient airfreight loading personnel for cargo handling. They are responsible for safe positioning of material handling equipment and cargo outside the aircraft. Under supervision of the boom operator, air freight personnel prepare the aircraft for loading (or stow loading equipment if the aircraft is not to be reloaded), physically load the aircraft, tie down cargo and equipment, release tie-downs, and physically off-load cargo.

13.2.1.2. The boom operator is responsible for aircraft preflight, preparation of DD Form 365-4, **Weight and Balance Clearance** Form F - Transport/Tactical, certifying load plans; operating aircraft loading equipment; supervising and directing loading, off-loading, and tie down; and coordinating with loading crew supervisor for checking the cargo against manifests. The boom operator may be required to assist in configuring the aircraft for cargo loading and unloading. When using the K-Loader powered roller system, ensure no personnel are standing on a powered roller or in the line of travel of a moving pallet. Should cargo, aircraft equipment, or aircraft structure be damaged during loading or off-loading, or should loading personnel be injured, the boom operator will notify the AC, the command post, and the terminal operations officer. Qualified ATS contractors may perform supervision duties during cargo qualification training.

13.2.1.3. Loads planned by qualified load planners will be accepted by the aircraft boom operator and loaded aboard the aircraft as planned, unless the load or any portion of it will compromise flight safety or does not comply with aircraft T.O.s, Air Force publications, or MAJCOM publications. If cargo is refused or rearranged for these reasons, all applicable information, to include a copy of the load plan, shippers declaration etc., will be attached to the aircraft commander's report. Send a duplicate copy through standardization channels to HQ AMC/DOVF. If situation warrants, due to safety violations, complete and submit an AF Form AMC Form 97, **AMC Unusual Occurance/Bird Strike Worksheet**. Attach copies of all documentation to this report.

13.2.1.4. At home station, maintenance is responsible for pre-deployment aircraft configuration. Boom operators must ensure all pre-deployment equipment has been properly secured and accomplish a roller system checkout IAW 1C-135(K)A-9.

13.2.2. At locations without an AMC air terminal or traffic personnel, the shipper assumes responsibilities in paragraph **13.2.1.1.** and provides sufficient qualified personnel and handling equipment for loading or off-loading. Boom operator responsibilities and authority are the same as described in paragraphs **13.2.1.2.** and **13.2.1.3.**

13.2.2.1. During joint airborne air transportability training (JA/ATT), special assignment airlift missions (SAAM), and US Air Force mobility missions, the boom operator can accept DD Form 2133, Joint Airlift Inspection Record, as valid pre-inspection of equipment being offered for air shipment. This form, validated by two joint inspector signatures, may be used in lieu of the applicable portions of T.O. 1C-135(K)A-9. The DD Form 2133 will not be used to document preparation of hazardous materials. This will be accomplished using the Shipper's Declaration for Dangerous Goods.

13.2.3. The boom operator should inspect all cargo for damage, liquid seepage or spills, proper fuel/oil servicing and packaging, prior to loading, as a final safety check.

13.3. Emergency Exits and Safety Aisles. Passengers and troops must have ready access to emergency exits. Load aircraft in such a manner that at least one unobstructed safety aisle in the cargo compartment allows movement from the crew compartment to the aft escape hatch and access to cargo for fire fighting.

NOTE: All hand-carried items must be of a size to fit under the seat and must not obstruct the aisle way. Any items that do not fit under a seat or obstruct an aisle way will be placed with cargo and secured for flight.

13.3.1. Aisle requirement. An aisle is defined as a space sufficient for an individual to proceed through. Tie-down devices are permitted, but they must not obstruct the opening or installation of hatches and operation of emergency gear or flap extension ports.

13.3.2. Aisle Space. A 14-inch aisle must be maintained between the edge of the extended canvas troop seat and the vertical stacking line of the cargo. If, in the case of centerline cargo loading with two aisles, sufficient aisle space cannot be maintained, passengers or cargo must be downloaded according to relative shipping priority.

13.3.3. Emergency exits. When carrying palletized cargo, the right overwing hatch may be blocked. Ensure all other exits are clear and operable.

13.4. Preflight Duties.

13.4.1. Cargo Missions.

13.4.1.1. Aerial port personnel establish loading times. Loading times that differ from the normal pre-departure sequence will be established before the boom operator enters crew rest. A second boom operator should be added to the crew during scheduled cargo missions when cargo loading time impacts normal crew duty time lines. Loading time is governed by the type of load and complexity of loading procedures (bulk, palletized, etc.) not by port saturation or management of aerial port work load levels. When reporting for duty, the boom operator will contact the ATOC to determine the planned load. At stations where there is not an ATOC, contact the agency responsi-

ble for these duties, e.g. passenger service, airfreight, etc. Request information on any unusual characteristics for the passenger or cargo load. After receiving the load breakdown from air terminal operations, brief the AC on any hazardous cargo, and proceed to the aircraft to accomplish checklists. Crewmembers not involved in cargo loading operations will be responsible for ordering and pickup of crew meals.

13.4.1.2. Proper cargo documentation must accompany each load. A consolidated statement (manifest) will be delivered to the aircraft prior to loading, unless one is not available due to a lack or failure of the manifest processing equipment. In this case, a cargo listing or floppy disks containing manifest information must accompany the load.

13.4.1.3. Make every effort to exchange tie-down equipment on a one-for-one basis. If this is not possible, annotate the AF Form 4069, **Tie down Equipment Checklist**. At non-AMC stations, 463L pallets will normally be exchanged on a one-for-one basis.

13.4.1.4. Cargo Restrictions. This paragraph supplements TO 1C-135(K)A-9. To ensure maximum crew and passenger safety, comply with the following:

13.4.1.4.1. Sufficient cargo handling and securing equipment must be on board each -135 to properly secure all planned cargo items from home station and items listed in departure and pre-departure messages.

13.4.1.4.2. The aircraft commander or boom operator is responsible for assuring all cargo is properly secured in compliance with TO 1C-135(K)A-9. All cargo and the MP-2 Seat Pallet will be secured using 3G forward restraint criteria.

13.4.1.4.3. In order to provide maximum passenger comfort, it is recommended that cargo or baggage be moved to one side of the fuselage (when possible) by stowing troop seats on that side.

13.4.1.5. Passenger Handling.

13.4.1.5.1. The maximum number of passengers may be limited by the amount of life support equipment, evacuation exits, and baggage securing capabilities.

13.4.1.5.2. Coordination between the boom operator and the ATOC representative will be required to determine the number of passengers and amount of baggage allowed. This will be based on the number, size, and configuration of the pallets or floor loaded cargo to be loaded.

13.4.1.5.3. The total number of personnel aboard -135 aircraft must not, under any normal condition, exceed the number of serviceable seats, with seat belts installed. Limited by egress considerations, the maximum number of passengers, under normal conditions is 57. Personnel will not be seated aft of the aft emergency escape hatch. When impending threat to life and the possibility of serious damage to equipment exists, the aircraft may be loaded to maximum seat and seat belt availability. When time permits, coordinate this with controlling agency.

13.4.1.6. The following procedures apply when using a forklift with rollerized tines or a forklift equipped with a trailer to load and unload 463L pallets from KC-135 aircraft.

13.4.1.6.1. A 10K forklift with a minimum of 72-inch rollerized tines or an A/M32H6 pallet trailer will be used.

13.4.1.6.2. Minimum number of personnel required to complete loading or unloading is 4 people in the aircraft to pull pallets, one ground spotter, and the forklift driver.

13.4.1.6.3. After completing the cargo-loading checklist, center the forklift on the cargo door, with the forward edge of the pallet approximately 12 inches beyond the edge of the cargo door. With roller tines, release the strap securing the pallet to the forklift. With pallet trailer, lower the safety guard securing the pallet to the trailer.

13.4.1.6.4. Raise the pallet until it is slightly above the cargo rollers. Move the forklift until the pallet is just outside the cargo door. Attach a 5,000-pound strap to each of the two corners of the pallet. Adjust the forklift height until pallet is slightly higher than the roller height. Do not allow forklift tines inside of cargo compartment. Pull pallet into aircraft.

13.4.1.6.5. When positioning the forklift, ensure the distance from the fuselage is adequate to offset forklift movement when a pallet is added or removed from the roller tines or trailer. The edges of the cargo door and door arms must be closely monitored while loading or offloading pallets. The pallet trailer is wider than the cargo door and the clearance is minimum when loading maximum contour pallets.

13.4.1.6.6. To offload pallet, position forklift centered on cargo door with rollerized tines level to the cargo rollers and a few inches outside the cargo door.

13.4.1.6.7. Push pallet slowly onto the forklift. Tilt forklift back. Back forklift from the aircraft and lower pallet to ground level. Repeat until aircraft is unloaded.

13.4.2. Passenger Missions. Maximize seat availability on mobility aircraft. It may be necessary for crews to perform passenger service functions at stations that do not have this capability. These functions include manifesting, anti-hijacking processing, and ensuring visa/passport requirements are met. Do not hesitate to contact TACC/APCC, DSN 576-1755 East cell/576-1758 West cell, commercial 618-256-1755/1758, if any questions arise such as to whom may travel to specific locations or passport/visa requirements. File a copy of the passenger manifest with the most responsible on-scene agency if there is no base operations or other agency responsible for filing the manifest. Air passenger service is responsible for the processing and scheduling of eligible passengers for airlift, loading and unloading of passengers, safety and comfort of passengers, and security and handling of baggage. They will advise passengers of the availability and local procedures for obtaining an in-flight meal. They ensure all border clearance requirements are met and prepare necessary forms for clearance through international border clearance agencies. They provide special handling for distinguished visitors, BLUE BARK, COIN ASSIST, and their dependents. Ensure sufficient infant cots are available for each mission when required.

13.4.2.1. Ensure all food items are removed from the aircraft by fleet and returned to the in-flight kitchen if an extended delay occurs. Ensure that a copy of AF Form 129, Tally In-Out, is received from fleet to relieve the boom operator of meal accountability.

13.4.2.2. Complimentary snacks and beverages are authorized on TWCF funded missions (including AFRC flown missions) for passenger consumption only. Complimentary snacks are not authorized on JA/ATT, JCS exercises, or SAAMs. The squadron or port operations officer will ensure snacks and beverages are placed on board when departing AMC stations. When departing from other stations and no snacks or beverages are to be placed onboard, the boom operator may obtain required snacks and beverages from the local in-flight kitchen. Direct the in-flight kitchen

to bill the accounting and finance office at the aircraft's home station. Record all unused snacks and beverages on AF Form 129 and return to the in-flight kitchen for turn-in credit.

13.4.2.3. Air passenger service personnel escort passengers to and from the aircraft and ensure prescribed procedures and safety precautions are followed during passenger and baggage loading and unloading operations. Sufficient copies of the passenger manifest must be given to the boom operator prior to passenger boarding. Introduce yourself, give a quick overview of the mission, and brief passengers using dash one briefing guide unless the passenger briefing video has been shown. A passenger service representative or crewmember will assist passengers at the bottom of the steps or aircraft ladder, and the boom operator will assist in seating passengers. Ensure that only adult, English-speaking passengers are seated next to emergency exits. The passenger video does not preclude individual briefings for personnel seated next to emergency exit hatches. Do not seat mothers with infants or children under 15 years old in seats adjacent to emergency exits. Make every effort to seat families together.

13.4.2.4. Passengers may hand-carry infant car seats. These seats will be secured to a seat using the seat belt. Adults will not hold infant seats during any phase of flight.

13.4.2.4.1. When children under the age of two are accepted as passengers, there sponsor must provide their own approved Infant Car Seat (ICS). If the mission aircraft is equipped with aft facing "airline style seats" no further action is required. However, if the aircraft is configured with side facing seats crews must ensure that the ICS is adequately secured. The design of the sidewall seatbelt makes it difficult to remove enough slack to secure the ICS. Crewmembers may need to reroute the seatbelt by crossing the belt, between the sidewall and the seatback webbing, routing the belt back through the webbing and through the securing point on the ICS. When removing slack from the seatbelt insure the buckle remains on one side or the other so that it can be easily accessed for release. The AC is the final authority for determining whether the ICS is adequately secured.

13.4.2.5. Oxygen masks must be available for both the adult and infant. Sponsors accompanying small children will be briefed to don their oxygen masks before assisting children to don theirs.

13.4.2.6. Download the baggage of no-show passengers and those removed from a flight. In the case of SAAMs or exercise missions at non-AMC locations, coordinate with tanker airlift control elements or deploying unit commanders to decide if the downloading of baggage is necessary.

13.4.3. The following procedures do not apply to unit deployments carrying deploying forces. This does not change the policy of safely carrying the maximum number of space-A passengers. The AC, as always, is the final arbiter as to how many space-A passengers can be safely transported.

13.4.3.1. Dependents, retirees, and civilian passenger will be seated on the seat pallet in pallet position number one or in LH and RH troop seats adjacent to empty pallet positions. They will not be seated in troop seats adjacent to cargo pallets. To enhance egress capability when carrying dependents, retirees, and civilian passengers, troop seats adjacent to cargo pallets will be stowed.

13.4.3.2. Placarded pallet height, number of pallets carried, and the tables below will determine seat release.

13.4.3.3. Tables 13.1 and 13.2 portray “minimum” seat release based on the following considerations: up to seven crewmembers/crew chiefs, serviceable seats, sufficient life support equipment, latrine limitations, and using a baggage pallet with 20 or more passengers. Additional crewmem-

bers or crew chiefs required by a particular mission will be deducted from these numbers. More seats may be released on a case-by-case basis at the AC's discretion. The following applies to all passengers (including MEGP and MMO, excluding mission crew chiefs.)

NOTE: If in the AC's judgement, pallet configuration provides additional (sufficient) aisle space, troop seats adjacent to the cargo pallets may be used.

Table 13.1. Seat Release without MP-2 Passenger Seat Pallet.

Pallets of Cargo	Seats to Release
6	0
5	10
4	15
3	20
2	25
0-10	30

Table 13.2. Seat Release with MP-2 Passenger Seat Pallet Installed.

Pallets of Cargo	Seat Release with all Pallets above 50"	Seat Release with one or More Pallets 50" or less
5	N/A	10
4	10	15
3	20	20
2	25	25
0-1	30	30

NOTE: A troop seat is available at STA 1140 for crewmembers and crew chiefs.

13.4.3.4. The seat pallet will be moved forward one detent (approximately 10 inches) to provide required 30 inch spacing forward of netted or strapped cargo. A sufficient aisle to and from the cockpit must be maintained for egress. Other pallets may be repositioned, and pallet stops and center roller tray assemblies removed, for passenger comfort and safety. Do not decrease number of passenger for this purpose.

13.4.3.5. When securing removed roller trays, do not over-tighten cargo straps as this may cause warping. Prior to moving any pallet, pallet stops and roller tray assemblies must be reinstalled as required.

13.4.3.6. Secure passenger baggage on top of any cargo pallet but do not exceed the 65-inch height limit. Additionally, the following restrictions apply. Do not wedge or secure baggage:

13.4.3.6.1. Between pallets.

13.4.3.6.2. Between the RH side of pallets and side of aircraft.

13.4.3.6.3. In compartments Q and R that exceed weight limits in T.O. 1C-135(K)A-9.

13.5. Passenger Handling.

13.5.1. The boom operator is the key figure for good passenger relations. There are certain rules that should be observed:

13.5.1.1. Address passengers by proper titles.

13.5.1.2. Avoid arguments and controversial subjects, national or international politics, criticism of other personnel or organizations.

13.5.1.3. Offer services or perform duties in a manner indicating a personal interest and willingness to help.

13.5.2. Comments by the boom operator and the manner in which they are made often determine passenger attitudes about the flight. Always remember that passengers are individuals; address them collectively only when making announcements.

13.5.2.1. Any time more than 10 passengers are carried an extra boom operator will be added for passenger control. In the event an extra boom operator is not available, an extra crewmember (pilot, copilot, or navigator) can be used provided they have been trained in passenger and emergency evacuation procedures and certified by the squadron commander. The boom operator or extra crewmember dedicated for passenger handling will be responsible for briefing the passengers and be on interphone in the cargo compartment at all times. When 10 or less passengers are carried, without a qualified crewmember dedicated for passenger supervision, boom operators will not relinquish their position in the cockpit; however, they will be responsible for assisting passengers in the event of an emergency. ***EXCEPTION:*** ACs may waive the above requirement on missions supporting actual SIOP recall, generation, execution, and regeneration. In this case, a troop commander will be identified, briefed, and assume responsibility for passenger control. MAJCOM or higher authority must approve all other waiver requests.

13.5.2.2. Dedicated crew chiefs are not counted against the maximum passenger number of 10 and will not be used to satisfy the requirement of a crewmember for passenger supervision.

13.5.2.3. When available, offer beverages or light refreshments to passengers.

13.5.2.4. Prior to departure, aircrew members will make every attempt to ensure the AF Form 4128, **Fleet Service Checklist,** is placed on the aircraft, filled in, and signed by the fleet service representative. At en route location, annotate section I with station ICAO or three letter identifier. This should correspond to section II, A/D, arrival/departure columns. If no fleet service is available, transfer information in section II from column 1 to column 2A/D as appropriate. Continue to annotate the inventory at each en route station until final termination/destination point is reached. If changes in inventory are made during stops, annotate section III with new amounts. If crewmembers notice equipment lost or missing, make every attempt to recover equipment. If unable to recover missing fleet service items, annotate section IV and have aircraft commander sign certification.

13.5.3. In-Flight Procedures:

13.5.3.1. After level off, and when cleared by the AC, Passengers may move about the cabin; however, judgment must be exercised on the number of passengers allowed out of their seats at any one time. Encourage passengers to remain seated with their seat belts fastened.

13.5.3.2. Make frequent checks on the following:

13.5.3.2.1. Cabin temperature.

13.5.3.2.2. Passengers with small children.

13.5.3.2.3. Cleanliness of the cabin and lavatories.

13.5.3.3. Do not allow passengers to tamper with emergency equipment. Passengers will not be permitted access to checked baggage.

13.5.3.4. On long flights, particularly during hours of darkness, use all possible means to make passengers comfortable. Dim and extinguish unnecessary compartment lights.

13.5.3.5. Passengers may visit the flight deck or boom compartment only when approved by the AC. Use good judgment when requesting this authority.

13.5.3.6. To assist in emergency evacuation of passengers, extra crewmembers or maintenance personnel knowledgeable of emergency evacuation procedures will occupy the seats closest to the emergency exit hatches for all takeoffs and landings. They will be responsible for opening these emergency exit hatches. If extra crewmembers or maintenance personnel are not available, English-speaking adults will be utilized. They will be briefed on emergency evacuation procedures.

13.5.3.7. Passengers will be supervised for the entire period of flight. During A/R, an extra crewmember, if on board, will remain in the cargo compartment. When this is not feasible the following procedures apply:

13.5.3.7.1. The boom operator will brief passengers to remain seated with their seat belts fastened during air refueling, unless specifically authorized by the AC to observe A/R. Boom operators may designate a passenger (preferably troop commander or equivalent) to supervise passengers and ensure compliance with passenger briefing items.

13.5.3.7.2. Any available, additional qualified aircrew member in the cargo compartment may monitor passengers.

13.5.3.7.3. The AC will be notified if any unusual circumstance relating to the passengers occurs.

13.5.3.8. When more than 10 passengers are carried, a crewmember will be in the passenger compartment for all takeoffs and landings.

13.5.4. Meal Service:

13.5.4.1. Meals are served at normal hours when practical, based on the local time at point of departure. Avoid waking passengers to offer meals. Ask the AC about expected flight conditions prior to meal preparation.

13.5.4.2. Passengers who have boarding passes (AMC 148-series forms, **Boarding/Pass Ticket**, that shows a meal was ordered) are served meals in the following sequence: (1) Small children requiring assistance, (2) Distinguished Visitors (DV), and (3) All other passengers.

13.5.4.3. Box Lunches. After takeoff, distribute box lunches to passengers who boarded at the previous station. This lessens confusion when flight segments are short and passengers board at subsequent stations. Additionally, ensure each passenger receives the correct meal by verifying the passenger's order.

13.5.4.4. Do not serve liquids or hot food during turbulence.

13.5.4.5. Turn in all meals unfit for consumption to the first in-flight kitchen. If in radio contact with the issuing station, relay aircraft tail number, mission identifier, number of spoiled meals (by menu), issuing organization, and in the case of frozen meals, the manufacturing agency, and manufacturer's lot number.

13.5.4.6. When prepared meals have not been furnished to passengers, the boom operator will annotate the individual's AMC Form 148 **Passenger/Boarding Ticket** to reflect reimbursement is authorized. Inform passengers they may receive refunds at the next station or the originating or destination terminal.

13.6. Over-Packed Meal Procedures.

13.6.1. Sign for over-packed in-flight meals and supplements delivered to the aircraft. These meals have been inventoried and annotated showing the total number of meals in each container. Do not open containers for inventory.

13.6.2. Obtain sufficient blank copies of AMC Form 305, **Receipt for Transfer of Cash and Vouchers**.

13.6.3. At the on-load station, contact the troop commander or other individual responsible for the mission. The unit or user is responsible for collecting for the meals prior to the on-load and for turning the money over to the boom operator with two separate listings. One listing will contain the names of those not on separate rations who are authorized to receive a government meal at no charge. The other list will contain names of those on separate rations and who pay for their meals. Both listings must be certified by the troop commander or individual responsible for the mission. The boom operator will count the money to ensure the total is correct and issue a receipt AMC Form 305 to the user.

13.6.4. At en route, remain overnight, or terminating stations, turn in the money and both listings to the in-flight kitchen. If an in-flight kitchen refuses to accept the money or meals, have the AC report the incident on AMC Form 54 **Aircraft Commander's Report on Services/Facilities** (see **Chapter 8** for instructions). Retain the money or meals and turn them in to the next available AMC in-flight kitchen. When a crew change occurs and the money or meals are transferred to the outbound boom operator, the inbound boom operator will retain the signed receipt as proof of money or meals transfer.

13.7. En Route and Post Flight Duties.

13.7.1. At stations where a crew change is made and loading or off-loading is required, the inbound boom operator is responsible for off-loading the aircraft. The outbound boom operator is responsible for planning and loading the outbound load. When no change occurs, the inbound boom operator is responsible for on-loading or off-loading cargo.

13.7.2. At crew stage points, brief relief personnel about passenger and aircraft equipment, any missing items, the location of through cargo, mail and baggage, and any information pertinent to through passengers. Point out cargo requiring special consideration (hazardous material, perishables, etc.).

13.7.3. Assist passengers to deplane. If BLUE BARK, DV, or couriers are aboard, the boom operator will inform the traffic or protocol representative.

13.8. Emergency Airlift of Personnel. The following procedures will apply to ensure a safe, efficient loading method for the emergency airlift of personnel from areas faced with enemy siege, hostile fire, for

humanitarian reasons, or when directed by the TACC. See **Chapter 20** for emergency airlift procedures of patients.

13.8.1. Emergency airlift normally will be accomplished without the use of individual seats or safety belts. The maximum number of personnel who may be airlifted by seating them on the cargo compartment floor will vary. Seat personnel in rows facing forward and load in small groups of 8 to 10 so they may be positioned and restrained by connecting the pre-positioned tie-down straps to tie-down rings. Load personal effects or baggage in the aircraft in any safe available position.

13.8.2. The maximum altitude for emergency airlift will not exceed FL 250.

13.9. Rucksacks. Rucksacks may be floor loaded. Rucksacks will not normally fit under the seats without obstructing the aisle way, therefore space must be allocated on the aircraft load plan for securing or palletizing. An unobstructed exit path must be maintained to evacuate the aircraft during emergencies.

13.10. Loaded Weapons. Weapons are considered loaded if a magazine or clip is installed in the weapon. This applies even though the clip or magazine is empty.

13.10.1. Personnel who will engage an enemy force immediately on arrival (actual combat) may carry basic combat loads on their person. Weapons will remain clear with magazines or clips removed, and all rifles will be stored on a pallet until immediately prior to exiting the aircraft.

13.10.2. Personnel who will not immediately engage an enemy force will store basic ammunition loads in a centralized location for redistribution on arrival at the objective. Magazines or clips will not be inserted into weapons.

13.11. Cargo Validation On-loading and Off-loading Procedures. In order to assist in the cargo validation process, use the cargo validation on loading and off-loading format in 13.15. Use this format when tasked to validate a new loading procedure or when encountering any cargo that you feel requires special or specific on-loading, off-loading or tie-down procedures that are not currently listed in T.O. 1C-135(K)A-9. After completion, send through channels to HQ AMC/DOVF.

13.12. Border Clearance. Customs, Immigration, and Agriculture require certain forms for border clearance. The boom operator is the custodian of these forms and for other forms that may be required during the flight or while on the ground. Ensure all required forms are aboard the aircraft before takeoff. Also, distribute the forms to the crew to ensure completion prior to landing and deliver to the proper persons at en route and terminating stations. On AE missions, the 3AET will coordinate with the boom operator to ensure customs forms are completed for patients.

NOTE: Ensure sufficient customs forms are available for each passenger. They should be provided by passenger service personnel prior to departure. Assist them as necessary, and ensure they are completed prior to landing.

13.13. Operational Forms for Boom Operators. Detailed instructions on the preparation, distribution, and use of the following forms will be found in the governing regulations:

13.13.1. AF From 96, **Passenger Manifest** (AFR 76-21).

13.13.2. AF Form 791, **Aerial/Tanker In-Flight Issue Log** (AFI 23-202).

13.13.3. DD Form 1854, **US Customs Accompanied Baggage Declaration** (DoD 5030.49R).

13.13.4. CF 7507, **General Declaration (Outbound/Inbound***)* (AFI 24-401,402,403,404, and AFR 161-71).

13.13.5. I-94, **Immigration Form, Arrival/Departure Record** (AFI 24-401,402,403,404).

13.13.6. AF Form 4069, **Tie-down Equipment Checklist**.

13.13.7. AF Form 4080, **Aircraft Load Data Worksheet**. May use this form for each leg of a cargo mission to keep track of the load and to aid when calling in load information to the off-load base.

13.13.8. AF Form 4100, **KC-135 Load Planning Worksheet**. May use this form to consolidate the pertinent information for the assigned cargo mission.

13.13.9. AF Form 4042, **KC-135 Restraint Computation Worksheet**. May use this form to determine required and applied restraint.

13.13.10. DD Form 2133, **Joint Airlift Inspection Record** (AFR 76-6).

13.14. Other Planning Forms and Worksheets. Use these forms as personal worksheets to complete DD Form.

13.14.1. 365-4 to meet requirements in TO 1C-135(K)A-9.

13.14.2. AF Form 4043, **KC-135 Load Planning Worksheet.**

13.14.3. AF Form 4042, **Applied Restraint Computations.**

13.14.4. AF Form 4100, **KC-135 Load Planning Worksheet** (Mx Chart C Worksheet).

13.14.5. AF Form 4044, **KC-135 Cargo/Passenger Planning Data.**

13.14.6. AF Form 4112, **KC-135 Restraint Computation Worksheet.**

13.15. Format For Validation Of Cargo On-Loading And Off-Loading Procedures. Use the following format when tasked to validate a new piece of equipment or when encountering any cargo that may require special or specific on-loading and off-loading procedures.

13.15.1. General Loading Data:

13.15.1.1. Nomenclature of item. Give military or civilian name, national stock number (NSN), and a brief description of the item, i.e. dump truck, medical van, etc.

13.15.1.2. Dimensions (in inches): Length, width, and height (rough drawing or picture of the unit, pointing out critical dimensions, projections, overhangs, etc.).

13.15.1.3. Weight (in pounds): Including; gross weight, individual axle weight, and data plate weight, if possible.

13.15.1.4. Crew number of loading crew personnel and boom operators required to on-load or off-load cargo and their required position to observe clearance, if required.

13.15.1.5. Equipment and Material Requirements - special equipment and material required to on-load and off-load cargo, i.e. cargo winch, prime mover, shoring requirements.

13.15.1.6. Aircraft Configuration Required.

13.15.1.7. Preparation of Cargo for Loading.

13.15.1.8. Loading Procedures.

13.15.1.9. Tie Down Points.

13.15.1.10. Off-loading Procedures.

13.15.1.11. Comments.

Chapter 14

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14.1. This chapter not used for KC-135 operations.

Chapter 15

AIR REFUELING

15.1. A/R Limitations. This chapter establishes procedures applicable to KC-135 aircraft and aircrews and is supplemental to those prescribed by the flight manual and other applicable directives.

15.1.1. Refueling During Training Missions. A/R should not be accomplished during training missions when:

15.1.1.1. Conditions are encountered that, in the opinion of either the AC or boom operator, result in marginal control of either aircraft or the boom.

15.1.1.2. Either the tanker or the receiver (except B-52) has less than the full number of engines operating.

15.1.1.3. Tanker aircraft is unable to retract the landing gear.

15.1.1.4. A Pod Control Panel and/or A/R Pod malfunction exists that can not be resolved.

15.1.2. Tanker Autopilot. Tanker pilots must notify receiver pilots when any axis of the autopilot is not used. If the tanker copilot is required to fly autopilot-off for training, unqualified receiver pilots will not fly the aircraft (N/A CCTS). Tanker pilots must notify the receiver when copilot autopilot-off training is conducted and receive confirmation that the receiver pilot flying the aircraft is qualified.

15.1.3. A/R Without Tanker Disconnect Capability. Without tanker disconnect capability means the boom operator cannot trigger an immediate disconnect. After a known loss of tanker disconnect capability with a particular receiver, do not attempt further contacts with that receiver. However, if the tanker signal system (signal coil) checks good, contact attempts with other receivers are permitted. If immediate disconnects cannot be triggered on two successive receiver systems, no further contacts will be attempted. Receivers may attempt a contact with another tanker, however after two successive failures to attain a disconnect, no further contacts will be attempted with that receiver.

EXCEPTION 1. Fuel emergency situation.

EXCEPTION 2. SIOP, conventional, contingency missions, airborne alert, ORI or CORI, Strategic Command and Control System (SCACS), receiver over water deployment or re-deployment, operational reconnaissance missions, and prime nuclear airlift force (PNAF) support missions under normal conditions when the refueling is essential for home base recovery.

NOTE: When conducting A/R without tanker disconnect capability, limit contacts to the minimum number necessary to complete mission requirements. Do not accomplish boom limit demonstrations, or practice emergency separations while in the contact position.

15.1.4. Manual Boom Latching (MBL) and Emergency Boom Latching (EBL). To complete training or evaluation in MBL and EBL procedures, the following conditions must be met:

15.1.4.1. Direct instructor pilot (IP) supervision is required on board receiver aircraft (if other than fighter type).

15.1.4.2. Contacts must be limited to the minimum required.

15.1.4.3. Receiver A/R system must be fully operable.

NOTE: Boom operator and receiver pilot must coordinate all actions as required by applicable directives and checklists when making A/R contacts during the situations listed above.

15.1.5. Prohibited Refueling Maneuvers. When operating in manual/emergency boom latching or when the tanker does not have disconnect capability, the following maneuvers are prohibited:

15.1.5.1. Practice emergency separation while in contact.

15.1.5.2. Demonstration of envelope limits.

15.1.6. Practice Emergency Separations.

15.1.6.1. Prior to the actual accomplishment of a practice emergency separation, coordination between the tanker pilot, boom operator, and receiver pilot is mandatory. Coordination must include when the separation will occur and who will give the command of execution. Tanker pilot coordination may be accomplished over interphone with the boom operator.

15.1.6.2. If separation is initiated from the contact position, the receiver's A/R system must be in normal, and a boom operator disconnect capability with the receiver must exist.

15.1.6.3. Practice emergency separations will not be accomplished with passengers on board unless passengers are seated with seat belts fastened.

15.1.7. Limit Demonstration. Before demonstrating limits, a boom operator initiated disconnect capability must exist with each aircraft requesting a limits demonstration.

15.1.8. Receiver A/R Training for Unqualified Receiver Pilots. (This includes copilots and dual seat qualified ACs refueling from the right seat.) Certification requirements for 1) ACs to supervise A/R conducted by a copilot or a dual seat qualified AC in the right seat and 2) Copilots and dual seat qualified ACs in the right seat to accomplish A/R will be determined by the Sq/CC. Both pilots must receive academic and in-flight training prior to certification. In-flight training for certification will be accomplished under direct IP supervision. When the training is complete, the Sq/CC will document the certification in the individual's FEF. Only copilots and dual seat qualified ACs designated by the squadron commander may attempt contacts without direct IP supervision. The following procedures apply:

15.1.8.1. The receiver pilot must inform and receive acknowledgment from the tanker.

15.1.8.2. The boom operator operating the boom controls must be qualified for the applicable category receiver (N/A for 97 AMW).

15.1.8.3. If the tanker autopilot is off, the tanker copilot will not fly the aircraft. (N/A for 97 AMW provided the student receiver pilot and the student tanker copilot are under direct IP supervision.)

15.1.9. Boom Operator Qualification or Training. Unqualified and non-current boom operators must be under direct instructor supervision to conduct A/R operations. The instructor boom operator supervising the A/R must have immediate access to the ruddevator control stick and have immediate communication capability with receiver aircraft.

15.1.9.1. All category qualification training requires supervision by an instructor current and qualified in that category receiver.

15.1.9.2. When day and night qualification is required, day qualification must be completed prior to night.

15.1.9.3. Prior to attempting initial contact (for that category receiver), the trainee must monitor radio communications and observe an instructor-demonstrated contact.

15.1.9.4. Loss of night currency will not cause loss of MR status for day operations.

15.1.10. Boom Operator Fatigue. If fatigue becomes a factor during A/R operations, the receiver will be directed to maintain the pre-contact position until fatigue is no longer a factor (boom operator judgment).

15.1.11. Crewmembers must be certified by the Sq/CC prior to accomplishing emission option 3 or 4.

15.2. Low Altitude A/R (LAAR). Do not conduct LAAR unless the tanker unit designed operations capability (DOC) statement identifies a need for LAAR or MAJCOM directed before the unit or crew members conducting in-flight LAAR training. Use the following training restrictions and limitations are as follows:

15.2.1. A/R operations are normally conducted above 12,000 feet MSL, or 10,000 AGL, whichever is higher. A/R performed below these altitudes is considered LAAR.

NOTES:

A/R operations based at or above 12,000 feet MSL which momentarily fall below 10,000 feet AGL, but not lower than 5,000 feet AGL, due to over flight of mountain ridges, peaks, etc., is not considered LAAR.

LAAR restrictions do not apply to C-130 A/R when A/R is accomplished at or above 5,000 feet AGL. Units providing refueling support to C-130 receivers are authorized to refuel at the receiver's optimum refueling altitude, but no lower than 5,000 feet AGL.

15.2.2. All occupants in the cockpit will wear helmets with visor down for protection against bird strikes. When available, a boom mike may be used to facilitate cross-cockpit communications. If the oxygen mask is not used, it will be in place for immediate communications.

15.2.3. Pilot familiarization may be accomplished from the jump seat.

15.2.4. A knowledgeable safety observer will be used to the maximum extent possible. The observer will assist the crew, but should not interfere with the navigator's performance of visual navigation.

15.2.5. Maximum time per sortie for LAAR will be 1 hour.

15.2.6. Perform during day, under VFR conditions.

15.2.7. Minimum altitude, 3,000 feet above the highest obstacle or terrain within 4 NM of course centerline, up to a maximum of 10,000-feet AGL.

15.2.8. Forecast, reported, or observed winds less than or equal to 27 knots.

15.2.9. Less than forecast, reported, or observed moderate turbulence.

15.2.10. Over flat and rolling terrain or a minimum of 10 NMs from land over contiguous water.

15.2.11. Route study required.

15.2.12. The autopilot rudder axis or yaw damper will be used if functioning properly. Other axes will not be used. Pre-coordinate this fact with the receiver.

15.2.13. Do not accomplish chemical warfare defense (CWD) training during LAAR.

15.2.14. Units will comply with the LAAR aircraft limitations and required inspections. Primary restrictions applicable to aircrews are as follows:

15.2.14.1. Only aircraft with TCTO-989 and -1200 completed will be used for LAAR.

15.2.14.2. LAAR airspeed will be limited to 300 KIAS maximum or charted holding speed minimum.

15.2.14.3. Maximum gross weight at start of LAAR activity shall not exceed 220,000 pounds.

15.2.14.4. Reserve tanks will remain full until termination of LAAR activity.

15.2.14.5. For overland LAAR, nondestructive inspections (NDI) must be complete.

15.2.14.6. Following LAAR or low-level navigation (LLNAV) training missions, aircrews will enter LAAR or LLNAV duration and airspeed and any moderate or greater turbulence encountered during LAAR or LLNAV into the aircraft AFTO Form 781, **AFORM Aircrew/Mission Flight Data Document**.

15.2.15. Aircrews will abort all LAAR training activity and climb-out of the LAAR area under any of the following conditions:

15.2.15.1. Wind, weather, or turbulence limits are reached.

15.2.15.2. MA-1 accelerometer exceeds readings of lower than .6 or higher than 1.4 Gs more than twice per minute.

15.2.15.3. On reaching termination fuel.

15.2.15.4. Aircraft strays from the LAAR airspace.

15.2.15.5. In the event of serious malfunction or emergency condition.

15.2.15.6. Loss of VFR conditions or cloud cover precludes maintaining visual contact with the ground or clearing the intended flight path.

15.2.15.7. The aircraft commander may terminate LAAR for fatigue or any other reason deemed appropriate.

15.3. Emergency A/R. When an emergency A/R requirement arises, units tasked will attempt to fill the requirement from available unit resources. Use unit training sorties as first priority and generated alert sorties as second priority. If no capability exists, notify the controlling agency of the requirement and unit shortfall. The following applies:

15.3.1. Units will not routinely preposition additional aircraft to satisfy potential emergency A/R requirements.

15.3.2. Time permitting, coordinate emergency A/R requirements with receiver parent MAJCOM or NAF.

15.3.3. The unit command post should coordinate or direct unit actions.

15.3.4. Identify unit sortie when notified of emergency air refueling requirement.

15.3.5. Coordinate with the OG/CC.

15.3.6. Notify NAF of requirement and proposed actions.

15.3.7. Notify squadron or aircrew of requirement. Provide ARCT, rendezvous information, altitude, receiver call sign, and communication plan.

15.3.8. Advise receiver of planned actions.

15.3.9. Notify the ARTCC liaison of requirement.

15.4. Tanker Aircraft Commander (AC) Responsibilities. Tanker ACs shall be responsible for:

15.4.1. Remaining within the protected lateral, longitudinal, and vertical airspace of the refueling track or anchor including orbit patterns.

15.4.2. Notifying the appropriate ATC facility of all altitudes vacated and not anticipated for further use by refueling aircraft. Such altitudes shall not be reoccupied without further ATC clearance.

15.4.3. Receiver navigation, regardless of the number of tankers or receivers, from the ARIP after rendezvous voice contact on air refueling frequency through completion of refueling operations except when under control responsibility of a military radar facility while in an anchor area.

15.4.4. Maintaining communications with the appropriate ATC facility. All communications during refueling operations, including those concerning the receivers, shall be between the ATC facility or military radar unit and tanker. To the extent practical, receivers shall establish communications with the tanker prior to or when departing the ARIP on the specified A/R frequency. After establishing voice contact with receivers, the tanker shall assume position-reporting responsibility for the receivers.

15.4.5. Coordinating altitude and route clearance:

15.4.5.1. From the ATC facility for both the receiver and tanker at least 5 minutes prior to refueling completion except when both aircraft are operating on an ALTRV.

15.4.5.2. Through the radar controller when operating in refueling anchors with military ground radar. At least 5 minutes prior to completing refueling operations, the military radar facility shall forward requests to the assigned ATC facility and subsequently relay ATC clearances for the tanker and receiver aircraft from the ATC facility.

15.4.6. Vertically positioning aircraft to the maximum extent practical prior to reaching the planning exit point. Vertically separating receivers and tankers shall be accomplished within the assigned altitudes, and is intended to beneficially contribute to the safe and efficient transfer of separation responsibility from the military, under the provisions of MARSA, to the ATC facility on completion of refueling operations.

15.4.7. Providing each receiver, upon request, with the aircraft's position at the completion of refueling operations. Additional information concerning amendments or changes to the receiver's ATC clearance shall also be provided as appropriate.

15.4.8. Formation. The tanker lead will coordinate all refueling formation operations to ensure all aircraft are in proper post air refueling formation prior to cell breakup. Aircraft must have positive altitude separation and be in a position to safely depart the air refueling formation. Prior to terminating air refueling, the tanker lead will confirm all aircraft in the formation are in proper post air refueling position with required lateral/vertical separation.

15.4.9. Accomplishing Search and Rescue (SAR) procedures IAW AFI 11-207, *Flight Delivery of Fighter Aircraft*. In an emergency, the flight leader immediately notifies the tanker commander. The tanker aircrew notifies ATC. In the event of a downed or ditched receiver, ATC notifies the Rescue Coordination Center, which in turn alerts the nearest SAR assets. The tanker provides cover as long as fuel reserves allow. Remaining receivers proceed unescorted to the nearest abort base or continue the mission with remaining tankers.

15.5. Receiver AC Responsibilities.

15.5.1. Receiver aircraft shall squawk normal when separation from the tanker is greater than 3 miles.

15.5.2. Receiver aircraft will maintain two-way radio contact with ATC until cleared to the A/R block altitude, established in that block, and cleared to the A/R frequency by ATC.

15.6. ATC Clearance. The tanker commander shall receive specific ATC clearance from the appropriate ATC facility for the following:

15.6.1. Altitude blocks to conduct A/R operation (except on an approved ALTRV).

15.6.2. Routings for each aircraft or formation flight if different than the flight plan routing.

15.6.3. Extending the refueling operations beyond the defined track or anchor exit point due to adverse winds, mission requirements, etc.

15.6.4. Additional altitudes in excess of those for which specific clearance has been granted (i.e. tobogganing).

15.7. Communications Failure. Aircraft experiencing two-way communications failure during the conduct of A/R shall continue flight in accordance with the following procedures:

15.7.1. Squawk code 7600 for at least 2 minutes prior to exiting the track or anchor.

15.7.2. Tanker aircraft that have not received altitude instructions beyond the exit point shall exit the track or anchor at the highest altitude specified in the clearance for the refueling portion of the flight and proceed in accordance with "Procedures for Two Way Radio Failure IFR-VFR" set forth in DoD Flight Information Handbook.

15.7.3. Receiver aircraft that have not received altitude instructions beyond the exit point shall exit the track or anchor at the lowest altitude specified in the clearance for the refueling portion of the of the flight and proceed in accordance with "Procedures for Two Way Radio Failure IFR-VFR" as set forth in DoD Flight Information Handbook.

15.8. MARSA Applicability for Aerial Refueling . MARSA begins between the tanker and receiver.hen the tanker advises ATC that it is accepting MARSA. MARSA is not an ICAO recognized term. If in doubt as to what separation is provided by ATC, or what separation the aircrew is responsible for, query the controlling agency.

15.8.1. MARSA ends between the tanker and receiver when the tanker advises ATC that the tanker and receiver aircraft are vertically positioned within the air refueling airspace and ATC advises MARSA is terminated.

15.8.2. After MARSA has been declared, controller-assigned course or altitude changes prior to rendezvous completion will automatically void MARSA and are to be avoided.

15.8.3. Once the rendezvous is completed, headings and altitude assignments may be made with the tanker concurrence with MARSA remaining in effect.

15.8.4. On rendezvous completion, each tanker shall keep receiver aircraft within 3 miles of the tanker until MARSA is terminated.

15.8.5. After air refueling clearance is received and until rendezvous is completed, aerial refueling airspace from the ARIP to the ARCP is sterilized. After rendezvous is completed and the tankers or receivers proceed down track, other non-participating aircraft may be cleared through the refueling block airspace with proper separation.

15.9. Coronet East Mission Over Flights in France. Aircrews must explicitly follow pre-coordinated.ission profiles on missions, which transit French airspace. Although ALTRVs are not formally recognized in the French ATC system, pre-coordinated Coronet East Missions are afforded a certain degree of additional protection while in French airspace. In exchange for this special handling, it is absolutely essential that aircrews adhere to pre-coordinated routes and altitudes to avoid problems (including the portion of the flight to/from the ALTRV). Failure to do so creates difficult diplomatic situations and jeopardizes future authorization for US Military over flights of France. Aircrews will not request any maneuvers that have not been coordinated in advance with French ATC. Examples of these maneuvers include formation split up and rejoin (unless pre-coordinated). During the portion of the flight to/from the ALTRV, tanker and receivers must remain in formation at a single altitude while in French airspace. If a request (even if pre-coordinated) is denied by the controller, follow their instructions.

15.10. Air-to-Air Refueling with Foreign Aircraft. When conducting exercises or contingency operations with tankers or receivers of foreign nations crews will review/understand ATP-56, Air to Air Refueling manual and ensure compliance. ATP-56 serves as the source document for air refueling information among participating countries and is no longer limited to NATO countries only.

15.10.1. Air-to-Air Refueling of Foreign Aircraft.

15.10.1.1. Air-to-Air Refueling Requirements Exclusively for USAF Receiver Aircraft (No US Requirement to Refuel Foreign Receiver Aircraft). Where there is no approved US requirement to refuel foreign receiver aircraft, air refueling of foreign aircraft must be on an opportune, non-interference basis. Tankers must be scheduled based on USAF mission requirements only, in accordance with normal USAF procedures. When a schedule is built to meet these mission requirements, it may result in some loiter time that foreign receivers can use under the criteria set forth in this directive. However, schedulers may not create excess loiter time simply to accommodate foreign receivers. If non-opportune refueling is required for foreign aircraft outside the "envelope" for meeting USAF mission requirements, the foreign government must pay for the additional loiter and boom/drogue time required, as well as for the fuel offloaded. This is because the costs of such support would not have been incurred but for the foreign government (non-US) requirement. The foreign government will not be charged for the transit time of the tanker aircraft as transit time was required for the USAF mission.

15.10.1.2. Foreign pilots must be qualified and current in USAF air-to-air refueling procedures. Exercise refueling will not be used as an instrument for foreign pilots to obtain initial qualifica-

tions, requalification, or to maintain currency. Provision of air refueling training requires a Foreign Military Sales (FMS) case (see DODD 5105.38, Section 100201.B., *Defense Security Assistance Agency* (DSAA)).

15.10.1.3. Receiver aircraft not previously certified for refueling operations must be certified for technical and operational compatibility in accordance with USAF regulations.

15.10.1.4. Foreign governments must pay for the fuel offloaded in accordance with USAF regulations and procedures (for example, pursuant to the terms of a reciprocal fuels agreement, cross-servicing agreement, or FMS case).

15.10.1.5. Status of Forces Agreement (SOFA) claims provisions, applicable to the nations involved, should cover liability. If a SOFA does not exist or is otherwise not applicable, a liability agreement must be established prior to the exercise. Such an agreement must be negotiated and concluded in accordance with DODD 5530.3, *International Agreements. T*hese types of agreements must be submitted to SAF/IA in accordance with paragraph 2.4. of AFI 51-701, *Negotiating, Concluding, Reporting, and Maintaining International Agreements*.

15.10.1.6. Valid US Requirements to Refuel Foreign Receiver Aircraft. It may be appropriate for the foreign government to fund only for the fuel offloaded when the purpose of a combined exercise is to employ coalition force concepts of operations that require USAF air refueling of foreign aircraft in support of DOD mission requirements and criteria in paragraphs 8.8.1.2, 8.8.1.3, 8.8.1.4, and 8.8.1.5 of AFI 10-204 (includes requirements in paragraph **15.10.1.2.-15.10.1.5.** (above). In such cases, a command coordinated request should be forwarded to AF/XO for approval to conduct the refueling operation on less than full cost reimbursement basis. The request should contain: a description of the operation, including objectives; the US mission requirements to be satisfied; a list of expenses to be assumed by the DOD and the funding source; and a list of expenses to be assumed by the foreign government, including method of payment to DOD for required reimbursements.

15.10.1.7. If the air-to-air refueling does not meet the criteria set forth above, air-to-air refueling must be conducted on a reimbursement basis. The foreign government must pay for the fuel, boom/drogue time, tanker transit time and loiter time, and all other costs as appropriate.

Chapter 16

MISSION PLANNING

16.1. Introduction. This chapter standardizes procedures for planning, briefing, and reviewing all missions. Mission planning is normally conducted the day prior to the mission. OG/CC may elect to use a "Same Day Mission Plan" option. The AC is ultimately responsible for the accuracy of the mission materials. Unit mission planning facilities should possess essential mission planning material.

16.2. Mission Planning.

16.2.1. Operational Missions. Staff planners should prepare detailed master flight plans to meet the requirements of the OPORD/Tasking. Flight plans based on a "planning forecast" should be reviewed before the mission is flown, using an "operational forecast."

16.2.1.1. As a minimum, prepare the following items as they apply to the mission:
FMS PCMCIA Card with DAFIF database current for date(s) of flight (Pacer CRAG only). Flight Plans, Maps, Charts, and Applicable Forms.
Copies of OPORD/Tasking.
Communication and EMCON requirements.
Air refueling data.
Tactics and procedures to be employed.

16.2.1.2. The preparing staff agency should provide complete and accurate data. Packages should be annotated to include who prepared the package.

16.2.2. Training Missions. Unit staff will determine who plans the mission.

16.3. Agency Briefing (if applicable). The mission briefing presented by the mission planners will normally be conducted no earlier than three days before the mission. The purpose of the mission briefing is to acquaint all crewmembers with the general aspects of the mission. The group or squadron commander, combat support group staff specialists, all crewmembers of each participating crew, and other personnel concerned with the mission should attend. The mission briefing may include all information pertinent to the mission and eliminate the need for later specialized briefings. In cases where highly specialized information or techniques require additional explanation or review (such as formation procedures), schedule a specialized briefing. During the briefing, indicate what preparation has been accomplished and what is yet to be accomplished. Use the following as a guide in conducting a briefing:

16.3.1. Security classification and roll call for the briefing and mission.

16.3.2. Purpose of the mission, forces required (to include number of aircraft) and a statement of mission requirements in sufficient detail to ensure all crewmembers understand all the information.

16.3.3. Mission Requirements:

16.3.4. Crew composition.

16.3.5. Crew alerting and reporting.

16.3.6. Minimum ground times.

16.3.7. Crew duty times.

16.3.8. Command waivers.

16.3.9. Rules of engagement (ROE).

16.3.10. EMCON level directed for each phase of flight.

16.3.11. Intelligence information.

16.3.12. Weather information.

16.3.13. Timing and control times to include:

16.3.14. Start times, taxi, and takeoff.

16.3.15. ARCT to include area and point for all refueling.

16.3.16. Landing time.

16.3.17. Review taxi, takeoff, and departure plans to include communications requirements and frequencies.

16.3.18. Navigation and altitude reservation flight plan.

16.3.19. Air refueling information and procedures.

16.3.20. Threat, special mission tactics.

16.3.21. Cargo load information.

16.3.22. Recall and diversion procedures.

16.3.23. Recovery and alternate base.

16.3.24. Announcements to include technical order status and changes, flying safety, specialized briefing times and locations, debriefing and interrogation location and procedures, messing, transportation, personal equipment, radio, and communications procedures and crew questions.

16.4. Crew Mission Study and Detailed Flight Planning. To acquaint aircrews with the mission and individual sortie requirements to ensure successful mission accomplishment. Wing and squadron staff should monitor crew activity and be able to resolve problem areas. Unit staff should allocate a minimum of 4 hours to accomplish mission planing and mission briefing. This period may be reduced in proportion to the amount of staff and computer prepared mission data available to the crew. However, in no case will mission planning be reduced to less than one hour. Mission planning should be accomplished as a crew. Unit staff should ensure that other activities do not interfere with mission planning and aircrew mission briefing. In cases where crews plan to brief and fly several missions, from various bases, in a short period of time, the AC will ensure the crew has sufficient time for mission planning.

16.5. AC Briefing. (See **Chapter 6** of this AFI) Conduct after each individual crewmember has completed their mission preparation. All crewmembers will be present unless excused by the AC. Crewmembers not present must be briefed by the AC prior to takeoff. The AC must re-brief the mission when the time interval from initial aircrew briefing to mission takeoff exceeds 72 hours.

16.6. Specialized Briefing. (See **Chapter 6** of this AFI).

16.7. Weather Briefing. (See **Chapter 6** of this AFI).

16.8. Post Mission Debriefing. Held immediately after the mission if practical. Include the following:

16.8.1. AC should contact the intelligence branch representative when hostile or suspect activity is encountered.

16.8.2. Aircrews should attend the operations and maintenance de-briefings as directed by unit commander. Maintenance de-brief should be conducted ASAP after flight.

16.8.3. The AC should conduct a crew critique with the entire crew present.

16.8.4. For formation flights, the formation leader should conduct a post mission critique.

Chapter 17

EMPLOYMENT

Certain technical information was intentionally omitted to keep this chapter UNCLASSIFIED. Users should NOTE that written additions to any portion of this section may alter the documents overall classification.

17.1. General. Each unit will have a tactics ground training program tailored to the unit's wartime taskings. Tactics and intelligence staff should join forces in this area to ensure success. Using a building block approach, the ground tactical training program forms the base of the unit's tactics program. Each unit's tactics ground training program may be different because of the differences between unit mission taskings; however the overall objectives should be the same. See AFI 11-415, *Weapons and Tactics Program* and AMCI 11-207, *AMC Tactics Program* for further guidance.

17.2. Responsibilities. The tactics ground training program will be a coordinated effort between the unit's intelligence staff, Wing Tactics, training (DOT), Stan/Eval (DOV), and operations plans (XPO) (or their equivalent) in order to ensure continuity and the unit's specific mission tasking is addressed. The program is the responsibility of the Sq/CC and is run by the unit tactics program manager.

17.2.1. Unit Tactics Program Manager. Responsible for the development, maintenance, and currency of the instructional materials used in the tactical training of crews. They are also responsible to find motivated, informed, and credible instructors to administer these materials. The program manager ensures the tactics training syllabus is comprehensive and covers all the aforementioned topics. More importantly, it is their responsibility to infuse tactics throughout the unit's operations, through classes, tactics simulator and flight profiles and other proactive aircrew members with tactics mission planning and initiatives.

17.2.2. Threat reference library/tactics read file/tactics newsletter. The unit tactics officer, with intelligence staff assistance, is responsible for developing procedures for timely dissemination of tactical and intelligence information to unit aircrew members.

17.2.2.1. Tactics Reference Library should be maintained by the unit tactics officer. This library provides study material at the unit level.

17.2.2.2. A by-subject Tactics Guide should also be developed and maintained by Wing Tactics and updated as materials are received.

17.2.2.3. The Tactics Read File should contain classified materials of timely interest to the aircrews. Read file may include messages, magazine articles, section out of MCM 3-1, *Tactical Analysis Bulletins*, etc.

17.3. Tactics Simulator Training.

17.3.1. Scope**.** Aircrews should practice all applicable tactical maneuvers in the simulator prior to attempting the maneuvers in-flight. Units may attempt any maneuver in the simulator.

NOTE: Use the simulator for tactics reinforcement. The simulator provides an inexpensive reinforcement and safe means of practicing tactics. Units should tailor the simulator to their specific taskings.

17.3.2. Responsibilities. The simulator instruction is accomplished by the unit tactics program manager with the help of the squadron training flight. The ATS contractor will handle the actual simulator operation. The simulator manager is responsible to see that maneuvers described in this AFI are flown in the simulator by all crews. Because no threat specific information is required for this training, the simulator training is unclassified. Classified tactics simulator profiles are under development at various units and are encouraged. Tactics simulator training can only be given during unit-directed periods and should not interfere with ATS contract training, use current or similar operational sortie profile. The following are suggestions for tactics profiles to be practiced in the simulator:

17.3.2.1. Extension maneuvers. Retrograde maneuvers accomplished from orbit speeds and refueling speeds.

17.3.2.2. Overshoot producing maneuvers. IR missile defense and GUN JINK maneuvers accomplished at altitude (3000 feet AGL).

17.3.2.3. Full crew simulators. The navigator/NSO and boom operator ride in the simulator with the pilot team to enhance crew coordination, aircrew survival and overcome system degrades.

17.3.2.4. Combat Departure/Arrival Training.

17.3.2.5. Toboggan descent to low-altitude A/R.

17.4. Tactics Flight Training.

17.4.1. Scope. The tactics flight-training program is designed to provide KC-135 crewmembers with the training necessary to confidently and successfully survive the wartime threat environment without endangering aircrews or aircraft in peacetime. This chapter identifies approved maneuvers for the tanker community. Do not attempt any maneuver not specifically mentioned in this publication without MAJCOM/DO approval.

17.4.1.1. Threat Avoidance Arrival/Departure Procedures (TAA/D). VFR Overhead Pattern, Random Steep Approach, Curvilinear Approach, and Spiral-Up Departure (see **Figure 17.1.**, **Figure 17.2.**, **Figure 17.3.**, and **Figure 17.4.**. respectively). Sq/CC certified ACs and above may accomplish TAA/D maneuvers. Accomplish TAA/D maneuver initial certification training on any sortie without passengers aboard. Once certified, TAA/D maneuvers may be flown on continuation training and operational missions with passengers aboard.

17.4.2. Objectives. Flight training is the final phase of the tactics program. Its goal is to combine the information presented from the ground and simulator phases and provides actual application of the tactics training concepts. Accomplish all flight maneuvers with strict adherence to aircraft limitations in the appropriate KC-135 flight manuals and this AFI. The flight phase also involves a “walk before you run” philosophy and is broken into three phases:

17.4.2.1. Phase One - Maneuver Familiarization:

17.4.2.1.1. Does not require a memorandum of agreement (MOA).

17.4.2.1.2. Does not require fighter or aggressor aircraft.

17.4.2.1.3. Demonstrates retrograde.

17.4.2.1.4. Timing of maneuvers is based on Bullseye/range information as provided by on-board tactics instructors.

17.4.2.2. Phase Two - Bullseye/retrograde training:

17.4.2.2.1. Can be accomplished as part of or addition to Joint Exercise.

17.4.2.2.2. Accomplish between pre- and post-A/R.

17.4.2.2.3. Use some type of airborne tracking system (ACMI/NACTS) as a debriefing tool, where available.

17.4.2.2.4. Debrief with Vertical Situation Display (VSD) video, when possible.

17.4.2.3. Phase Three - Composite Exercises. Tanker aircrews should operate out of the same base as the rest of the exercise players. Also, the crews will be active participants in the pre-brief and post-mission debriefs.

17.4.2.3.1. Participate in composite force exercises.

17.4.2.3.2. Educate receiver and tanker aircrews.

17.4.2.3.3. Develop combat support mindset.

17.4.2.3.4. Real-time kill removal places emphasis on integrating tanker assets into the overall picture.

17.4.3. Flight Training Limitations and Restrictions:

17.4.3.1. Limitations. Use the following table to determine which maneuvers are approved for flight and which require waivers:

Table 17.1. Tactics Maneuvers.

ITEM	AIRCRAFT	SIMULATOR
Combat Departures	NO	YES
Combat Arrivals	NO	YES
Quick Flow Air Refueling	YES/NOTE 1	UNABLE
Low Altitude Air Refueling	YES	YES
Retrograde Tactics	YES/NOTE 2	YES
Formation Breakups	YES/NOTE 3	YES
Gun Jink	NO	YES
Threat Avoidance Arrivals/Departures	YES	YES

NOTE 1: Do not conduct Quick Flow Air Refueling until formal incorporation into refueling manuals.

NOTE 2: In response to a simulated fighter attack, single tanker maneuvers will be limited by air work parameters in **Chapter 6** of this AFI. Tanker formations limit maneuvering to a normal formation turn described **Chapter 18**. MAJCOM/DOV will approve requests to conduct actual fighter intercepts/attacks against tanker aircraft. See requirements and limitations in AFI 11-214.

NOTE 3: Pending completion of tanker formation breakup, tactics development and evaluation, formation breakup procedures should be limited to procedures described in **Chapter 18**.

17.4.3.2. Restrictions.

17.4.3.2.1. Intercept Training.

17.4.3.2.1.1. All participants conduct face-to-face coordination on specific aircraft maneuvering categories, range safety requirements, and fighter engagement parameters prior to flight if possible.

17.4.3.2.1.2. If tankers are engaged during the mission, face-to-face debriefings with the intercepting fighter pilot will be accomplished if collocated.

17.4.3.2.1.3. Accomplish training within a designated MOA. In addition to safety, the primary responsibility of the aircrew is avoiding spill-outs.

17.4.3.2.1.4. Tanker aircrews check-in with the appropriate controlling agency (AWACS/GCI), including missions using EMCON 3. All participating aircraft monitor UHF guard (243.0 MHz).

17.4.3.2.1.5. Jamming should not be conducted on guard or any other pre-designated frequency.

17.4.3.2.1.6. Tanker aircraft should be in the unlimited maneuver category for air-to-air training, which is described as no restrictions except those stated in the flight manual and this AFI. Tanker aircrews must be aware of their own personal flying skills and limitations when determining the level of tactical maneuvers employed. The limiting factor is not always aircraft limits.

17.4.3.2.1.7. For training sorties, pending completion and resolution of the tactics development and evaluation on tanker retrograde maneuvers, tanker aircraft will limit evasive maneuvering when in formation to a normal formation turn as defined in chapter. Limit extension, separation, and retrograde maneuver accomplished by a 180-degree or less level turn, to 30 degrees of bank when in formation.

17.4.3.2.1.8. Fighters intercepting without an operative radar should make day VMC stern attacks only.

17.4.3.2.1.9. Tankers may terminate an intercept with a radio call of "knock-it-off, knock-it-off, knock-it-off" or "terminate, terminate, terminate." Use the phrase "knock-it-off" only when safety of flight is a factor. It directs all aircraft to cease maneuvering. The "terminate" call will end the local engagement and a "knock-it-off" call will end the entire exercise. Tanker crews should follow the "terminate" call with their tactical call sign and aircraft type to preclude mistaken identities from impacting the whole exercise. (i.e. Terminate, Terminate, Terminate, Bosco 41, KC-135).

17.4.3.2.1.10. Fighter aircraft will maintain at least 1,000 feet vertical separation from tankers unless at least one of the following applies: (1) Separation from tanker is greater than 10 miles, (2) Tanker is closer than 10 miles but not a factor (i.e. collision potential) based on situation awareness, or (3) Visual contact is established.

17.4.3.2.1.11. Minimum range during intercepts of AMC tanker aircraft is 1000 feet or the MAJCOM or service minimums of the attacking fighter, whichever is greater.

17.4.3.2.2. Low-Altitude Air Refueling (LAAR). LAAR training restrictions and limitations in **Chapter 15** will apply. Units will not complete LAAR unless specifically tasked in response to a valid support requirement and MAJCOM/DO approval.

17.4.4. Threat Avoidance Arrivals/Departures (TAA/D).

17.4.4.1. VFR Overhead Pattern.

17.4.4.1.1. Limitations:

May be performed single ship or 2-ship only.

Maximum bank angle 30°.

Minimum weather VFR (maintain VMC).

Minimum altitude 1500 AGL for lowest aircraft in the formation.

Maximum speed 250 KIAS.

17.4.4.1.2. Procedures:

17.4.4.1.2.1. Configure fuel panel and set altimeters prior to initial break.

17.4.4.1.2.2. Enter initial (3 NM minimum) at overhead pattern altitude (1500 ft AGL min) and 250 KIAS. Cells maintain altitude separation. Report initial on tower frequency.

17.4.4.1.2.3. Break at approach end (departure end for #2) - adjust power as required and pitchout using 30° bank.

17.4.4.1.2.4. Rollout on downwind, extend landing gear and lower flaps (#2 descend 500 ft).

17.4.4.1.2.5. Maintain overhead pattern altitude until starting final turn.

17.4.4.1.2.6. Approximately 2 miles past approach end - initiate final turn (30°-bank max).

17.4.4.1.2.7. Rollout on final not less than 300 ft AGL and 1 NM from threshold.

17.4.4.1.2.8. Perform normal landing.

17.4.4.2. Random Steep Approach.

17.4.4.2.1. Limitations:

May be performed single ship only.

Maximum bank angle 30°.

Minimum weather VFR (maintain VMC).

Maximum speed 220 KIAS.

17.4.4.2.2. Procedures:

17.4.4.2.2.1. Establish position directly overhead the airfield, approximately 5000 feet AGL.

17.4.4.2.2.2. Lower flaps to 20, extend gear and begin right or left spiral turn using maximum 30° bank, throttles idle.

17.4.4.2.2.3. Plan rollout to enter a normal VFR downwind at 1000 feet AGL minimum.

17.4.4.2.2.4. Slow and configure flaps normally.

17.4.4.2.2.5. Perform normal VFR landing.

17.4.4.3. Curvilinear Approach.

17.4.4.3.1. Limitations:

May be performed single ship only.

Maximum bank angle is 30°.

Minimum weather VFR (maintain VMC).

17.4.4.3.2. Procedures:

17.4.4.3.2.1. From a position other than a straight-in final or normal VFR traffic pattern, initiate a descending, turning track from a random altitude, distance, and location from the airfield.

17.4.4.3.2.2. Maneuver to roll out (configured) on final not less than 300 AGL and 1 NM from threshold.

17.4.4.3.2.3. Perform normal landing.

17.4.4.4. Spiral-Up Departure.

17.4.4.4.1. Limitations:

May be performed single ship only.

Maximum bank angle is 30°.

Minimum weather: VFR (maintain VMC).

Minimum speed: 3-engine climb plus 30 KIAS.

Maximum pitch: 25°.

17.4.4.4.2. Procedures:

17.4.4.4.2.1. Perform 20-flap max mode takeoff with MCL thrust setting.

17.4.4.4.2.2. On departure, maintain normal maneuver speed (greater than 15° of pitch is authorized) and takeoff flap setting. After passing 400 ft AGL, initiate a left or right 30° bank turn.

17.4.4.4.2.3. When above 5000 ft AGL or clear of threat, reduce pitch, rollout, and clean up.

17.4.4.4.2.4. Assume normal climb schedule.

17.5. Exercises.

17.5.1. Scope. Exercises provide realistic combat-scenario training and Air Force doctrine. This training is representative of the unit mission tasking. Unit planner ensures exercises are planned, flown and debriefed to maximize tanker training objectives.

17.5.2. Objectives. Tanker tactics training will be built into each exercise during the planning stage. Training objectives include but are not limited to Tanker Doctrine, large formation refueling, AWACS interface, high value airborne assets (HVAA), tactical deception, threat advisories, and defensive tactics. Consider the following elements during exercise planing:

17.5.2.1. Utilize warning, alerting, deployment and execution orders.

17.5.2.2. Theater ATOs should be sent secure by STU III and FAX at least one day during the exercise.

17.5.2.3. A sortie rate of no less than 1.0 is the goal for Combat Reach Deployments.

17.5.2.4. Employ minimum communications deployment package or consider requesting combat communications element.

17.5.2.5. Conventional exercises should stress the "ability to survive and operate" (ATSO) in a chemical environment as much as possible within the constraints of equipment, budget, and supplies.

17.5.3. Red/Green/Maple Flag. Through a joint effort to enhance tanker training at Flag exercises, selected crews attend the mass mission briefings and debriefings at Nellis AFB NV. The TTF commander will ensure a tanker staff or aircrew member attends the PACKAGE COMMANDER meetings to ensure specific tanker ATO requirements are addressed. To do this, the “Casino Tanker” concept is included in all Flag exercises on a space available basis.

17.5.3.1. Casino Tanker Concept. A minimum of one KC-135 should remain overnight at Nellis AFB, Monday through Thursday. The crews participate in the mass package debrief after landing, spend the night, then attend the mass briefing in support of the next day's mission. Tanker rotation should be every other day and scheduled through the 414th Combat Training Squadron (CTS), Operating Location B, Air Mobility Warfare Center (AMWC), at Nellis AFB. Final departure is Thursday in support of P.M. flight scheduling.

17.5.3.2. Casino Tanker Aircraft Condition. Aircraft recovering at Nellis AFB, are maintenance code “one” and accompanied by a minimum of two crew chiefs per aircraft. Transient maintenance provides tanker parking and recovery. There is no support or supply parts for KC-135 aircraft at Nellis AFB. RED/GREEN FLAG TTF staff at the deployed location makes the determination of maintenance status. The aircraft crew chiefs accomplish refueling, servicing, and minor maintenance.

17.5.3.3. Casino Tanker Utilization. Tankers support the exercise from Nellis AFB and remain under control of the TTF at the deployed location.

17.5.4. USAF Weapons School, Mission Employment (ME) Phase. Tanker participation at ME is managed by the AMWC/WCOX. A superior working knowledge of tactics concepts significantly enhances aircrew performance during the intense training of the ME phase.

17.5.4.1. ME Phase Tanker Objectives:

17.5.4.1.1. Develop an understanding of the capabilities of other composite force aircraft in order to effectively integrate tanker support into a sound tactical game plan.

17.5.4.1.2. Apply knowledge of the threat to maximize survivability of friendly aircraft.

17.5.4.1.3. Demonstrate proficiency in operating Have Quick and KY-58 secure radios.

17.5.4.1.4. Exercise contingency tactical game plans to avoid threats.

17.5.4.1.4.1. Tanker retrograde is the primary contingency plan.

17.5.4.1.4.2. Stresses situation awareness.

17.5.4.1.5. Exercise EMCON game plans to deny information to the enemy.

17.5.4.1.6. Exercise deconfliction plans to ensure safe marshaling of aircraft.

17.5.4.1.7. Understand current employment doctrine.

17.5.4.2. Unit Requirements. The ME phase represents graduate-level training. The crews selected to participate in this exercise should be prepared for a challenging, dynamic tactics environment. Units will:

17.5.4.3. Deploy crews with at least one member a Tactics School Graduate (either SAC or AMC). This provides the crew with a knowledgeable point of contact and helps facilitate greater involvement in the tactics arena.

17.5.4.4. Deploy a tactics officer as staff personnel with the crews selected to participate in the exercise. The tactics officer will augment the AMWC staff supporting ME phase. The tactics officer acquires practical experience in composite force operations.

17.5.5. COPE THUNDER Exercises. COPE THUNDER is a PACAF composite force exercise flown from Eielson AFB. The AMWC may provide tactics instructors to deploy along with the tanker unit supporting COPE THUNDER. The tanker unit provides a detachment commander (DETCO) and senior maintenance supervisor. Tanker training objectives are identical to employment phase tanker objectives.

17.5.6. Exercise After-Action Reports. Units prepare exercise after action reports for RED, GREEN, and MAPLE Flags; COMBAT REACH; Fighter Weapons School (FWS) employment phase; COPE THUNDER; and other deployments. Submit this report to HQ AMC/DOK and AMWC/WCOX in message form not later than 10 working days after mission completion. Message should be written in Joint Universal Lessons Learned System (JULLS) format and address applicable items below.

17.5.6.1. Deployments supported by multiple units. The lead unit will submit the report for the exercise.

17.5.6.2. JULLS Report Contents.

General synopsis of exercise to include number of personnel, aircraft and duration of deployment.

Extent of support provided by host base.

Extent of support provided by exercise managers and staff.

Adequacy of billeting and transportation.

Number of sorties.

Were retrograde maneuvers utilized? How many?

How was situation awareness (SA) developed for the tankers?

Did they have Bullseye calls from AWACs, GCI, other?

Close control or broadcast?

Any special equipment or techniques used?

For RED and GREEN Flag:

Casino Tanker responses should re-address bullet items above.

Was Casino Tanker available?

Did crews participate in mass briefings?

Was Casino Tanker program effective?

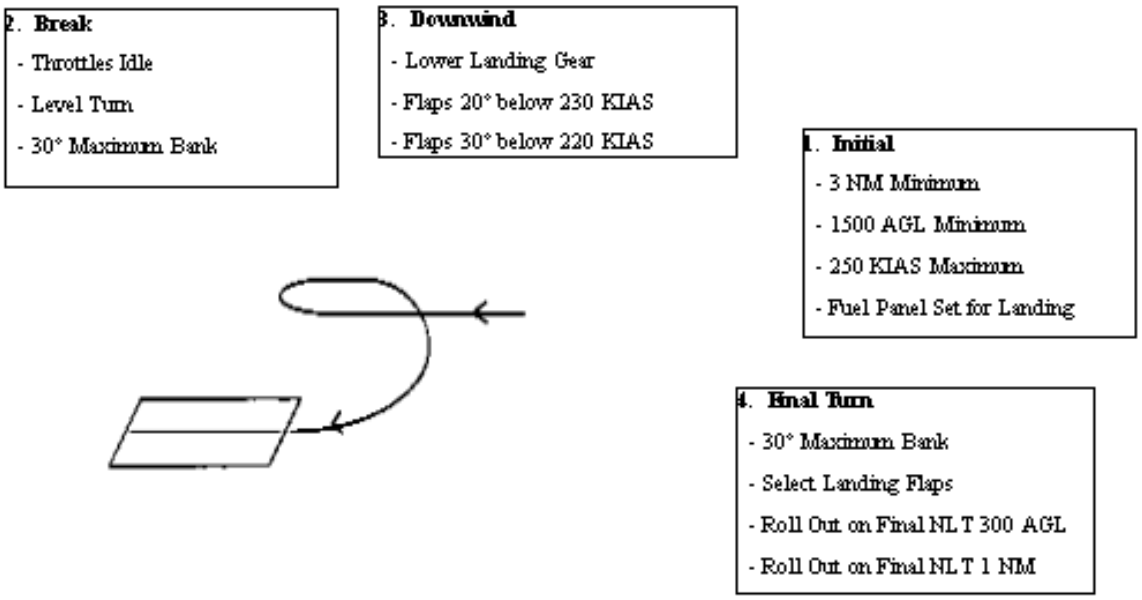
Where did fighters intercept tankers?

Problems associated with exercise.

Suggestions to improve exercise.

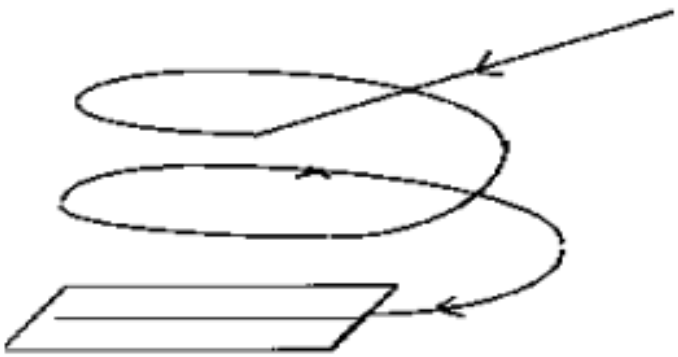
Tactics lessons learned.

Figure 17.1. VFR OVERHEAD PATTERN.



NOTE: Airspeeds, altitudes, and distances are approximate and may be adjusted to fit the tactical situation.

Figure 17.2. RANDOM STEEP APPROACH.

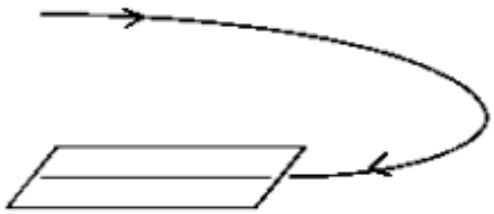


Procedures

- Establish Position Overhead
- Speed below 230 KIAS
- Lower Landing Gear & Flaps 20°
- Throttles Idle
- Accomplish Spiral Descent
- 30° Maximum Bank

NOTE: Airspeeds, altitudes, and distances are approximate and may be adjusted to fit the tactical situation.

Figure 17.3. Curvilinear Approach.

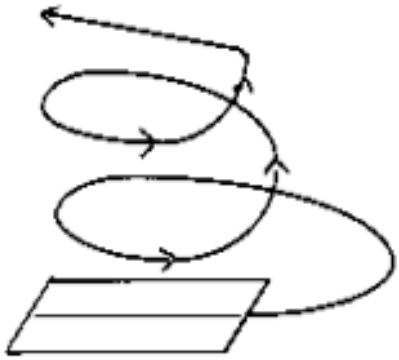


Procedures

- From Random Position, Altitude, Distance
- Initiate Descending, Turning Track
- 30 Degrees Maximum Bank
- Configure Normally
- Roll Out on Final NLT 300 AGL
- Roll Out on Final NLT 1 NM

NOTE: Airspeeds, altitudes, and distances are approximate and may be adjusted to fit the tactical situation.

Figure 17.4. Spiral-Up Departure.



Procedures

- After Gear retraction, maintain takeoff flaps setting
- Passing 400 feet AGL, begin 15° bank turn
- Lower pitch and accelerate to Normal Maneuver speed
- Increase Bank Angle to 30°
- Select Climb Power After Passing 2000 feet AGL
- Passing 5000 AGL (or Clear of Threat), Roll-out on desired heading
- Clean Up and accelerate and resume Normal Climb

NOTE: Airspeeds, altitudes, and distances are approximate and may be adjusted to fit the tactical situation.

Chapter 18

AIRCRAFT FORMATION

Section 18A—General

18.1. Scope. This chapter covers basic formation procedures and operations. All procedures described are general and apply to all KC-135 and KC-10 aircraft.

18.1.1. Use procedures in this chapter in conjunction with applicable A/R manual.

18.1.2. These procedures have been standardized with KC-10 formation operations in AFI 11-2KC-10V3, *KC-10 Operations Procedures*.

18.2. Concept. The formation procedures described in this chapter are designed to enhance the efficiency, effectiveness, and safe operations of the KC-135. The broad term "formation" as used does not differentiate between specific tactics of en route formation or visual formation. Specific references to each tactic must be made to ensure complete understanding. Failure of any crewmember to comply with these procedures jeopardizes the safety of aircraft and aircrews. A major factor in formation design is to provide mutual support. Once formations are formed, they should be maintained to provide this mutual support provided they do not unduly interfere with formation operations.

18.3. Safety. Formation is a potentially hazardous operation. Compliance with the specified procedures is essential to the safe conduct of any training or combat mission. **These procedures, however, cannot substitute for proper aircrew judgment during fluid formation operations.**

18.4. Definitions.

18.4.1. Formation Flight. By FAA definition; flight with more than one aircraft that, by prior arrangement between pilots, operates as a single aircraft with regard to navigation and position reporting. Separation between aircraft within the formation is the responsibility of the flight leader and the pilots of the other aircraft in the flight. This includes transition periods when aircraft within the formation are maneuvering to attain separation from each other to effect individual control or during join-up or break-up.

18.4.1.1. A standard formation is one in which a proximity of no more than 1-mile laterally or longitudinally and 100 feet vertically from the flight leader is maintained by each wingman.

18.4.1.2. Nonstandard formations are those operating under any of the following conditions:

18.4.1.2.1. When the flight leader has requested and ARTCC has approved other than standard formation dimensions.

18.4.1.2.2. When operating within an authorized ALTRV or under the provisions of a letter of agreement.

18.4.1.2.3. When operations are conducted in airspace specifically designed for special activity.

18.4.1.3. Most formations are nonstandard and should be so indicated in the remarks section of the filed flight plan. Flight leaders are required to advise ARTCC on initial contact, and each sub-

sequent controller or controlling agency, of separation being used. Advisories are not required when operating within an ALTRV or airspace specifically designed for formation flight activity.

18.4.1.4. When flying a nonstandard formation, ARTCC must be advised of the longitudinal, lateral, or vertical separation between the flight lead and the last aircraft in the formation, so appropriate separation may be provided from non-participating aircraft.

18.4.1.5. Should separation between the flight leader and any other aircraft in the formation exceed ARTCC separation limitations or vary significantly from that reported to the ARTCC for the nonstandard formation, the aircraft outside the formation limits will no longer be considered part of the formation. The pilot will inform the formation leader of his or her position and request the ARTCC to provide individual control until the aircraft is re-established in formation.

18.4.2. Formation Departure. The departure of multiple aircraft at intervals of one minute or less which, by prior arrangement between the pilots, operate as a single aircraft with regard to navigation and position reporting. The departure portion of the flight ends at the planned level off at cruise altitude, but may terminate earlier at a pre-planned break-up point.

18.4.3. Stream Formation. A formation flight with two or more aircraft (or formations of aircraft) operating along the same intended route of flight as individual aircraft with regard to navigation and position reporting. Separation between consecutive aircraft or formations should not be less than 30 seconds nor more than 3 minutes longitudinally and 3000 feet vertically. Stream formation is "nonstandard" by FAA definition.

18.5. Responsibilities.

18.5.1. Formation Mission Planning, Briefing, and Debriefing. Formation flights will be planned, briefed, and critiqued in accordance with this chapter. The formation leader should use the Formation Briefing Guide (attachment 18.1) to conduct the flight crew briefings. This briefing guide may be supplemented as required.

18.5.2. Lead Responsibilities:

18.5.2.1. Proper formation is an extremely demanding task, especially for the leader who is responsible for the C2 of the formation. In formation, all pilots and crews qualified according to command procedures may be designated as formation leaders. However, the most qualified pilots and crews should be designated formation leader for operational missions.

18.5.2.2. Formation integrity and discipline begin with formation briefing. Leader must ensure all aspects of the mission are understood. When deviations from the briefed mission are necessary, the leader will direct them. No actions will be taken until they have been coordinated with and are understood by all formation members.

18.5.2.3. Formations comprised of non-collocated units must be thoroughly coordinated to ensure safe operations when a single formation briefing cannot be attended by all participants. Coordination of these formations will include designation of mission commander responsibilities for all phases of the formation operation.

18.5.2.4. Leaders must remember aircraft control is a basic element of good formation. Smooth aircraft control when accomplishing turns or changing altitude enhances formation integrity.

18.5.2.5. Each formation member must be aware of the position, performance, and capabilities of all flight members at all times and ensure appropriate station-keeping is maintained to provide positive aircraft separation.

18.5.2.6. Differing performance capabilities of other aircraft require additional considerations, particularly when dissimilar aircraft are mixed in a single formation.

18.5.3. Wingman Responsibilities:

18.5.3.1. Keep the leader in visual or electronic contact at all times and remain situationally aware of the position of other formation members.

18.5.3.2. Maintain briefed position.

18.5.3.3. Anticipate corrections and plan ahead.

18.5.3.4. Monitor all aspects of formation operations and advise the leader if any unsafe condition is noted.

18.5.3.5. Be prepared to assume the lead.

18.5.3.6. Execute lost wingman procedures when appropriate.

18.5.4. Crew Coordination. Maintaining formation integrity requires each crewmember to assist the pilot in monitoring the position of all flight aircraft. In order to properly maintain position in formation, the pilot not flying the aircraft or other crewmembers, designated by the AC, must keep the pilot advised of the distance from other aircraft and trends, e.g. "one mile and steady," "one mile, closing slightly or dropping back," etc. Pass trend information at a rate concurrent with movement or closure. Particular attention is essential during join-ups, lead or position changes, lost wingman procedures, A/R, and formation break-up.

18.5.5. Unit Responsibilities. All units will comply with formation takeoff and departure procedures in this chapter and should develop local procedures for the areas not covered herein. These procedures should include provisions for items such as aborts, lost communications, EMCON, and the recovery of formation aircraft.

18.6. Communications and Radio Procedures.

18.6.1. General. This paragraph describes radio procedures and phraseology to be used in the conduct of formation missions. Radio terminology should be standardized to the maximum extent; however, it is impractical to prescribe specific radio calls for all situations. A radio-monitoring plan should be developed and briefed to ensure complete understanding by all formation participants.

18.6.1.1. Radio and interphone discipline are critical factors in maintaining formation integrity. Strict radio and interphone discipline must be enforced to ensure flight safety and mission effectiveness. geographical points, times, etc., may be used to aid or direct frequency changes. Use secure voice or HAVE QUICK when practical. Flight members will transmit only information essential to the safe conduct of the mission. Radio calls will be clear and concise.

18.6.1.2. UHF and VHF radios as available will normally be designated the primary means of communication between aircraft. Formation will not be flown on training sorties without interplane communications capability, except in an emergency. All aircraft should monitor the same ARTCC frequency.

18.6.1.3. Visual signals may be used as an alternate or secondary means of communication between aircraft.

18.6.2. Use of Radio:

18.6.2.1. One radio in each aircraft will be designated as the "primary" radio, which will be used for ARTCC reporting and formation control. As available, other radios will be designated for communications other than ARTCC; such as interplane and C2 communications. If it is necessary to use the ARTCC radio for formation interplane communications, the flight member initiating the radio call will identify which radio is being used, e.g. "Tanker 66, this is tanker 56 on primary."

18.6.2.2. UHF or VHF guard channels (if available) will be monitored by all aircraft.

18.6.2.3. Flight lead will initiate all frequency changes. Wingmen should acknowledge in order and wait for every flight member to acknowledge before changing frequencies. Lead will allow enough time for frequency change to be accomplished before initiating check-in. Lead must ensure all flight members are on frequency before initiating any action or making any radio calls to ARTCC, etc. If a flight member does not respond, a secondary radio or guard may be used to direct the wingman to the proper frequency. Specific procedures should be pre-briefed by the flight lead. Crews should maintain non-primary radios during silent operations; however, planned frequency changes may be performed on briefed timing or visual signals. All flight members must be on a common frequency.

18.6.2.4. Call Signs:

18.6.2.4.1. Unless otherwise directed by a specific operations or communication plan, the flight call sign for ARTCC reporting will be the flight leader's tactical call sign. For interplane communications, flight members may use a pre-briefed call sign, e.g. RED FLIGHT, etc., if desired.

18.6.2.4.2. Formation aircraft will retain and use individual call signs for all rendezvous and A/R operations, unless directed otherwise in the OPLAN. For large formation A/R operations, aircraft may use assigned A/R position for communication with their A/R mate. For any abnormal or emergency situations use call sign.

18.6.2.4.3. Individual call signs will be used for single-ship operations on formation break-up.

18.6.3. EMCON. The importance of EMCON in a threat environment cannot be overemphasized; it must be practiced to the greatest extent possible. The following list of EMCON options provides standardized terminology and procedures for formation requirements.

NOTE: Do not sacrifice safety in order to strictly adhere to EMCON procedures. For Pacer CRAG, this may include doing no more than using the ATC: OUT function when flying cell formation in IFR, or potential IFR, conditions.

18.6.3.1. Emission Option 1. Any and all emitters are authorized to ensure timely training or feedback and maximum safety. This option is normally used for initial qualification, category qualification, and difference training for tanker or receiver units.

18.6.3.2. Emission Option 2 (Restricted Communications). Radio silent formation except for rendezvous and A/R con-ducted with only two radio exchanges. 15 minutes prior to the rendezvous or ARCT, receivers will advise tankers of call signs, altitude, changes in timing (if applicable), i.e. "Oscar 25 flight, FL 250, on time." Tankers will verify altitude and timing, i.e. "Felix 57,

FL 260, on time." Tankers and receivers will use the adjusted rendezvous control time established during 15-minute call. Use minimum radio transmissions required to coordinate A/R. All other emitters are authorized. Essential radio communications for safety of flight may be made. An abbreviated pre-contact radio check is required when the receiver reaches pre-contact. Boom operator will transmit numerical call signs only, i.e. "25, 57" and the receiver will respond "25." If this check cannot be completed, A/R will not be accomplished unless mission priority or receiver emergency fuel status dictates. Receivers will not close from pre-contact until either this radio check is accomplished or visual signals direct approach to contact. This option is the desired standard for day-to-day A/R operations.

18.6.3.3. Emission Option 3 (Communication Out). Radio silent formation, including rendezvous and refueling. The use of other emitters is authorized unless prohibited. Essential radio communications for safety of flight may be made.

18.6.3.4. Emission Option 4 (Emission Out). Emitters (radios, Doppler, beacons, radar, radar altimeters, IFF exterior lighting, etc.) will not be used unless specifically authorized by the ATO, rules of engagement (ROE), OPLANs, SAFE PASSAGE procedures, or other mission directives. Essential radio communications for safety of flight may be made.

18.6.3.5. Emission Options 2 through 4. When using these options, boom interphone should be used when compatible. Tanker and receiver planners will coordinate and crews will be thoroughly briefed on formation procedures, type rendezvous, rendezvous point and time, tanker and receiver altitudes, formation break-up procedures, and missed rendezvous procedures (including refueling area departure time and back-up communications procedures). If different emission options are to be used during different phases of the route, this should be included in the briefing.

18.6.4. Standard Radio Calls. **Table 18.1.** lists standardized radio calls and phraseology that may be used as appropriate on formation flights (except those conducted under options 2 through 4 above). Timely communication or required information must take precedence over the specific wording shown.

Table 18.1. Standardized Radio Calls.

Action	Example
1. All calls initiated by lead will be prefaced by flight call sign.	BOSCO 04 flight go 345.1. BOSCO 04 flight check-in.
2. All calls initiated by wingmen will be prefaced by flight call sign and position.	BOSCO 04 bogey 10 o'clock low. BOSCO 04 "two"...on secondary.
3. All acknowledgment calls by wingmen will be by position and in order.	BOSCO 04 flight, lead, change...."two," "three."
4. Takeoff abort call.	*(Call sign)* abort, *(call sign)* abort,*(call sign)* abort.
5. Aircraft will check in as pre briefed on interplane or departure. Lead will make all calls to ARTCC once formation is joined as appropriate.	"BOSCO 05—airborne" or "departure control, BOSCO 05." "Departure control, BOSCO 04 flight, climbing to FL 240 block 260."

6. In formation, lead will announce heading, altitude, and airspeed changes. (Depending on EMCON level).	BOSCO 04 flight—right turn...050, level FL240... accelerate to 450 true.
7. Lead may coordinate, as applicable, any change of aircraft configuration. When simultaneous action by other flight members is required, the preface will be followed by the command of execution "NOW."	BOSCO 04 flight—speed brakes...NOW.
8. If a wingman desires a power change.	BOSCO 04 lead—push it up ___. BOSCO 04 lead—pull it back __.
9. position change during formation.	BOSCO 04 flight—position change; two move forward to lead position. BOSCO 04—two, you have lead, Roger, I have the lead.
10. Action Cells	BOSCO 04, two...
Radar contact established	Radar contact
Visual contact established	Visual contact
Established in position	In position
Lost visual or radar contact	Lost visual or radar
Join-up overshoot	Overshooting
Breaking out	Breaking out
Traffic calls	Bogey, 9 o-clock
Lost wingman	Lost wingman
NOTE: When assured no other formation will be in range or using the same frequency or a discrete frequency has been assigned to the formation, call signs may be abbreviated for clarity and brevity, e.g. "BOSCO flight...climb check" (acknowledged) "two," "three." When checking in a flight after a frequency change, lead's transmission should be shortened, e.g. "BOSCO 04" and acknowledged by "two," "three" before lead proceeds to talk.	

18.7. Supplementary Information. Supplementary information is located in A/R manuals, aircraft specific tactics, and other sections within this chapter.

Section 18B—Formation

18.8. General.

18.8.1. This section describes tactics, techniques, and procedures used to join and maintain formation and applies to all aircraft. Formation will be flown as dictated by mission requirements, weather, degraded equipment, communications plans, or other tactical considerations. This section is not all encompassing and can in no way substitute for good judgment or common sense during conditions of reduced visibility or other circumstances.

18.8.2. Each unit will develop post takeoff separation procedures and departure separation plans with the local controlling agency. The training departure should closely parallel the unit's wartime departure plan (if applicable) while conforming to peacetime safety of flight restrictions. Each plan must

consider emergency aspects, aircraft performance capabilities, terrain features, penetration of weather after takeoff, and local ATC restrictions.

18.8.3. Formation leaders are responsible for the entire formation during flight. They must ensure coordination with ARTCC facilities, tanker, or receiver aircraft, and other members of the formation is accomplished prior to taking any actions. Because of following aircraft, the additional airspace, time, mission requirements, etc., the formation leader must think and plan further ahead than when flying as a single-ship aircraft. Additionally, the formation leader must be prepared to make timely decisions and direct actions should any unplanned or emergency situations arise.

18.8.4. Formation members must be thoroughly familiar with the tactics, procedures, flying and clearing techniques, and formation duties required during the mission. in-flight, they must maintain proper formation position and be prepared to assist the formation leader and to assume formation lead responsibilities if called on to do so.

18.8.5. Performance capabilities of other aircraft (KC-135E/R, F-16, B-1B, KC-10 etc.) require additional considerations; particularly when dissimilar aircraft are mixed in a single formation. It is incumbent on the formation leader to understand the performance capabilities and limitations of all aircraft in the formation.

18.8.6. Hazards associated with wake turbulence and wing tip vortices in multiple heavy aircraft formation should be thoroughly understood by all formation members. Pre-mission formation briefings will include emphasis on proper lateral or vertical positioning to avoid encountering these hazards.

18.8.7. Mixed Pacer CRAG/non-Pacer CRAG Formation. It must be emphasized that all non-Pacer CRAG formation members must squawk both modes 3A and C for Pacer CRAG aircraft in the formation to electronically monitor position. This will sometimes require extensive coordination with ARTCC. Two procedures which often are acceptable to ARTCC:

18.8.7.1. Non-Pacer CRAG aircraft squawk mode 3A “4000” with mode C “on”

18.8.7.2. Place non-Pacer CRAG aircraft as either lead or behind all Pacer CRAG aircraft.

18.8.8. Pacer CRAG Formation Procedures.

18.8.8.1. During formation departure and join-up, all aircraft will squawk normal with Mode 3 and C ON, TCAS range (RNG) set to extended (EXT), TCAS envelope (ENV) set to Above, TCAS Air Traffic Control Interrogation (ATC) set to ON, and TCAS sensitivity (SENS) set to Traffic Advisory/Resolution Advisory (TA/RA). This allows for ATC monitoring of the individual aircraft in the formation and provides both the formation and other aircraft full TCAS resolution advisory coverage.

18.8.8.2. As the other formation aircraft approach formation position, lead aircraft will change TCAS sensitivity (SENS) to Traffic Advisory only (TA), so that they will not receive Resolution Advisories caused by the formation join-up of other members.

18.8.8.3. As each formation member closes into formation position on lead, they will change TCAS sensitivity (SENS) to Traffic Advisory only (TA), TCAS envelope (ENV) to Normal (NORM), and TCAS Air Traffic Control Interrogation (ATC) to OFF. This allows all formation members to display all other formation members on TCAS, but provides ARTCC with a picture identical to what they saw with non-Pacer CRAG tankers. Other TCAS equipped aircraft outside

the formation will also now see all formation aircraft instead of just the lead aircraft, and will respond to TAs and RAs on any formation member.

18.8.8.4. All formation aircraft will keep TCAS sensitivity (SENS) set to Traffic Advisory only (TA) until formation breakup, to preclude inadvertent RAs amongst the formation members. At breakup, ensure that TCAS sensitivity (SENS) is set to Traffic Advisory/Resolution Advisory (TA/RA) and TCAS Air Traffic Control Interrogation (ATC) is set to ON.

18.8.8.5. For formations larger than a three-ship, the last aircraft in the formation has always squawked normal for ARTCC position tracking. With Pacer CRAG, the last aircraft in a formation larger than a three-ship will, upon closing into formation position on lead, change TCAS sensitivity (SENS) to Traffic Advisory only (TA) and TCAS envelope (ENV) to Normal (NORM), but they will leave TCAS Air Traffic Control Interrogation (ATC) set to ON."

18.9. Launch, Departure, and Level-Off.

18.9.1. Formation Briefing. The formation leader will conduct a detailed briefing for all crewmembers covering the planned activities, procedures, techniques, specific EMCON procedures, and division of formation responsibilities. Boom operators may be excused from the formation briefing for cargo loading, however the AC will back brief all appropriate items. If lead changes are planned, each formation lead will brief their portion of the mission. The recommended formation briefing guide (attachment 1) should be used to conduct the briefing. As a minimum, the briefing must include all applicable items listed in the guide. The formation leader must ensure all crewmembers thoroughly understand their responsibilities, to include assumption of formation leadership. Any questions during the briefing must be adequately resolved. If aircraft depart from separate bases and then rendezvous for formation activity, the formation leader should ensure a telephone briefing is conducted with joining tanker and receiver formation leaders; however, if this is not possible, after detailed sortie study, the coordination and briefing between the appropriate lead planning agencies or mission commanders will satisfy formation briefing requirements.

NOTE: For non-collocated aircraft, SIOP study meets formation-briefing requirements.

18.9.2. Taxi Procedures (Parking to Runway). Units may establish taxi plans from the normal parking area to each runway. Follow the taxi sequence established in the briefing. The formation leader should accomplish radio checks and copy ATC clearance in the chocks. Pacer CRAG crews will, as soon as practical, but prior to takeoff, use TCAS to "tag" the Mode 3A codes for other aircraft in their cell. All participating crews will accomplish as much of the pre-takeoff checklists as possible prior to taxi. lead will obtain taxi and takeoff clearance.

18.9.3. Takeoff Timing Interval. Defined as the time between initiation of takeoff power for each successive aircraft in the formation. Hold-line timing should be used only as back up. Use of takeoff power radio calls is not recommended. The takeoff interval must ensure adequate separation exists until aircraft normal procedures allow turns for track separation. Due to turbulence caused by jet blast, following aircraft should maintain a minimum safe distance behind preceding aircraft.

18.9.3.1. Use **Table 18.2.** to determine the minimum allowable takeoff interval. The takeoff interval may be increased at the discretion of the formation lead based on several factors, including takeoff conditions and aircraft performance.

18.9.3.2. If it is not possible to determine power application of the preceding aircraft, following aircraft should base their timing on the preceding aircraft aligning with the runway and in a position to commence takeoff.

Table 18.2. Minimum Formation Interval Chart.

LEAD AIRCRAFT	FOLLOWING AIRCRAFT		
MDS Aircraft	**KC-135R/T**	**KC-135E (*4*,5)**	**KC-10A**
KC-135R/T	30	30	60
KC-135E (*4*,*5*)	40	30	60
KC-10	60	60	60
B-1B (*2*,*3*)	30	30	60
B-52	40 (*6*)	40	60
E-4	60	60	60

NOTES:

1. Above intervals are in seconds. For example, a KC-135R interval with the E-4 is 60 seconds.

2. Takeoff gross weight for aircraft preceding B-1Bs use maximum takeoff weight of 225,000 pounds.

3. The B-1B causes extreme turbulence or heat up to 200 feet aft of the aircraft when in maximum afterburner (300 knots/375 degrees F). Following aircraft are especially susceptible to engine damage during rapid power changes if following too closely to a B-1B. As a guide, dissimilar aircraft should maintain at least 200-feet nose-tail clearance behind B-1B at the beginning of takeoff roll.

4. For KC-135 reverse thrust equipped aircraft in a mixed formation, the normal procedure is to plan takeoff data without reverse thrust. When takeoff data is planned with reverse, aircrews must be cognizant of the increased closure rate by trailing aircraft when aborting. Consideration should be given to not using reverse thrust unless stopping distance is critical.

5. Includes all TF-33 equipped C/KC-135 aircraft.

6. For a KC-135R/T leading, use a recommended weight differential of 260,000/395,000 for B-52H. If these weights are not operationally feasible, a gross weight combination proportional to maximum aircraft gross weights is recommended.

18.9.4. Formation Takeoff Procedure (Hold-Line Through Takeoff): Receivers should takeoff first. Takeoff intervals or sequence may be varied as necessary depending on aircraft acceleration and performance, training requirements, weather, airfield conditions, and mission requirements. An abort call will be made any time takeoff is aborted.

18.9.4.1. Maintain proper takeoff interval and a safe speed during taxi. Use lead-in lines to align aircraft for takeoff. Adherence to timing and spacing intervals is essential to ensure safety. If less than the above timing or spacing is used, any degradation of the preceding aircraft's performance, such as loss of an engine, afterburner, etc., will result in a progressively dangerous reduction in aircraft spacing as lift off is approached.

18.9.4.2. All takeoffs are accomplished using runway centerline.

18.9.4.3. Effective crew coordination is extremely important in all takeoffs. Crew procedures must be well-briefed and maximum alertness maintained. Strict radio and interphone discipline must be maintained and transmissions minimized so all aircraft are able to immediately recognize an abort call during takeoff.

18.9.4.4. The effects of turbulence and vortex generation increase as the takeoff roll progresses, reaching a maximum at unstick and may require large, impulse type control deflections. One-half control wheel or stick deflections just prior to takeoff may be encountered. These forces are comparable to takeoff with gusty wind conditions. The effects of turbulence may be decreased after takeoff by turning slightly left or right as soon as possible after airborne to place the aircraft upwind (if possible) and out of the vortex of the preceding aircraft.

18.9.4.5. When the decision to abort a takeoff is made, use the following procedures: An abort call will be made when a takeoff is aborted. At bases with dual runway operations, aborting aircraft should identify the runway in use.

NOTE: Control tower operators observing an aircraft abort will echo the abort call over guard (243.0 or 121.5 MHz) and the frequency being used to control the launch.

18.9.5. Filing Procedures. Flight plans for all formation members will reflect the same route of flight for the portion of the flight the aircraft will be in formation. The following recommended remarks may be included on the DD Form 175 for the appropriate flight segments. Local procedures for filing may be used provided they are coordinated and documented in writing by the unit and local FAA (or ICAO) representatives.

18.9.5.1. Departure/En Route: "MARSA Non Std Frmn Dep w/ Pawn 71 & 72 to LIN 149051"

18.9.5.2. En Route Joinup: "MARSA Non Std Frmn w/ Pawn 81 & 82 from CZQ 040030 to OED 191079 FL250B260"

18.9.5.3. Departure w/ A/R: "MARSA Non Std Frmn Dep w/ Pawn 91 to RBL 278/114 AR FL240B270 w/ Bosco 11"

NOTE: Remarks should be in the same chronological order as the flight plan. 21 characters may print out on the controller's flight strip; the remainder must be manually retrieved by the controller. To minimize any confusion between controller and aircrew, abbreviate to the shortest recognizable form.

18.9.6. Departure. During mixed KC-135/KC-10 cell formation departures, the normal planned climb speed is 285 KIAS for formations with KC-10s less than 500,000 pounds gross weight and 310 KIAS for formations with KC-10s equal to or greater than 500,000 pounds gross weight. Planned climb speeds apply to the lead aircraft only. Following aircraft may exceed or reduce these speeds as necessary to accomplish the rejoin and maintain proper formation position. In all cases, formation leaders may adjust the climb speed schedule as aircraft performance dictates. (Planned climb speed will not be less than minimum maneuver speed of the heaviest aircraft.) Maintain-flight path upwind (if possible) of preceding aircraft to minimize wake turbulence effects. During the departure and climb, fly the briefed routing, climb speed, and vertical velocity. If TCAS, radar, visual, and radio contact are all lost, and altitude separation cannot be ensured, lost wingman and locally developed abort procedures will be accomplished. All available means both electronic and visual, should be used to maintain safe aircraft separation and effect formation join-up after takeoff. During climb-out, if an intermediate level off is necessary, avoid climbing through the wake turbulence of preceding aircraft. Wingmen may attempt to close to en route spacing during climb-out, provided TCAS, radar, or visual contact is

maintained, safety and weather conditions permit, and procedures were briefed during the formation briefing.

18.9.6.1. Join-Up Techniques. The following techniques may be employed to effect join-up during a climb. Visual cutoff in departure turns (requires either prior coordination with or approval from ARTCC facilities), differential airspeed, power management, and effective use of the TCAS and radar, both on-board and ground based. Regardless of the techniques employed, altitude separation must be carefully monitored during closure to en route spacing. Under other than VMC or when visual contact cannot be maintained with all formation members, ensure altitude separation by periodically having each aircraft in the formation report its altitude or flight level. Formation integrity and formation position will be maintained during any cutoff maneuver. The closing aircraft will monitor lead aircraft's relative position. Lead must monitor the formation using all available means during departure and join-up. Lead must be prepared to assist wingmen if they have trouble locating lead.

18.9.6.2. Cutoff (Day/VMC). To close formation during turns, closing aircraft may turn inside the preceding aircraft's turn track, within tech order limits, and then return to preceding aircraft's turn track when desired spacing is established. Clearance to deviate from departure routing must be obtained either by prior agreement with ARTCC or from the controlling agency prior to initiating the turn. Altitude spacing is not guaranteed and extreme caution must be exercised to prevent an overshoot. Airspeed differential and cutoff during large departure turns should be used conservatively. Too much overtake results when too large of a cutoff angle and differential airspeed are combined. During visual cutoff maneuvers, be aware of inadvertent over banking and pitch control. Unusual attitudes can develop. If bank angle becomes excessive, or misjudgment in closure occurs, take necessary corrective action and inform the trailing aircraft of intentions. All crewmembers will assist in providing range and position on following aircraft throughout cutoff maneuvers.

18.9.6.3. Night or Instrument Conditions. During night or instrument flight conditions, aircraft should turn at the same geographic points as the preceding aircraft.

18.9.6.4. Differential Airspeeds. Differential airspeeds may be used on climbout to close to en route spacing. The number and performance capability of aircraft in the formation will determine the maximum amount of overtake between aircraft that is possible. Caution must be exercised to avoid excessive overtake situations. If an overshoot appears imminent, pilots must take immediate corrective action (i.e. increase drag) and notify other formation members of intentions.

18.9.6.5. Formation Join-Up. Cutoff, differential airspeed, and power management are normally used to expedite formation join-up, particularly where large numbers of aircraft are participating in the formation. Crews must be constantly aware of their closure rate as formation position is approached. Additionally, when differential airspeed is used throughout a formation, each succeeding aircraft must increase its lead point for deceleration consistent with formation position.

18.9.7. Aborts. Any aborting aircraft will clear the planned launch stream and take appropriate actions dictated by the reason for abort. The formation leader should be advised of any abort and attempt to assist the aborting aircraft in any way possible. If the mission allows, lead may designate an escort. Aborting aircraft will obtain ATC clearance prior to altering their route or declare an emergency and deviate as necessary.

18.9.8. Level Off. Lead initially maintains a briefed airspeed at level off to allow formation closure. Adjust to cruise airspeed at the briefed action point or when directed by lead. An altitude block will be obtained for all intermediate and final level-off altitudes. Block altitudes must provide a minimum of 500-foot separation between aircraft. All aircraft will call reaching intermediate level-off altitudes (normally stack down from lead) and close to en route formation spacing. If ARTCC will not approve a block altitude, then request IFR separation or hard IFR altitudes for each aircraft in formation; do not accept clearances to maintain a single altitude.

18.10. En route Formation.

18.10.1. En route formation consists of multiple tanker aircraft, in trail, stacked up at 500-foot intervals with 1 NM separation (2 NMs may be used for contingency operations). The primary means of maintaining proper formation position are radar or TCAS under instrument conditions and visual, TCAS, or radar under visual conditions. Secondary means include TACAN/DME, VOR/DME, UHF/DF, A/A TACAN, etc. In instrument conditions, the apparent movement of a return on the TCAS display, radarscope is the best aid in maintaining formation position. Because of allowable equipment tolerances and limitations, A/A TACAN and ARTCC radar are not recommended for use in maintaining precise formation. Weather, tactical considerations, and mission objectives dictate the degree electronic emissions are used. When visual conditions permit, minimize radio transmissions. Heading and airspeed changes need not be announced.

18.10.2. The lead aircraft should ensure the formation is aware of any change in heading, airspeed, altitude, or formation duties through precise pre-briefing and interplane communication. Any deviation from announced altitude, airspeed, or heading will be magnified with each succeeding aircraft. Once the formation is established, following aircraft should maintain their position with reference to the lead aircraft; however, be aware of the position of other aircraft in the formation. Following aircraft must attempt to fly the same ground track. The following techniques help maintain en route formation:

18.10.2.1. Turns. One of the most common turn techniques is when formation lead pre-briefs specific bank angles for turns. For example, lead may brief aircraft to use the same number of degrees of bank angle as the heading change up to 10-degree and use 25-degree bank angles for turns greater than 10 degrees. This also will help reduce interplane communications. To maintain formation position during turns, all aircraft must initiate the turn over the same geographic point. This requires each succeeding aircraft to delay the turn for a set amount of time after lead has initiated their turn. For example, at 450 KTAS, the time to travel 1 NM is approximately 8 seconds; therefore, the number two aircraft will not begin its turn until approximately 8 seconds after the lead to ensure the aircraft turns over the same geographic point.

18.10.2.2. Airspeed and Altitude. Airspeed and altitude must be closely monitored and controlled throughout formation flight. Power settings and rates of climb, descents, airspeed increases and decreases must be pre-briefed or announced on interplane frequency to allow formation members to maintain position. With mixed formations, one technique is to use a constant vertical velocity and constant indicated airspeed for climbs or descents. The mission must be planned to consider the airspeed requirements of the highest or heaviest aircraft, whichever is more restrictive. As a general rule, a 3-KIAS reduction in airspeed per 500-foot increase in altitude will maintain proper in trail spacing. For example, if lead is flying 270 KIAS, then #2 would fly 267 KIAS and #3

would fly 264 KIAS, and so on. Lead must ensure the target airspeed is compatible with the most restrictive aircraft in the formation.

18.10.2.3. Power and Heading Corrections. If the formation leader and formation aircraft make small power and heading corrections, formation aircraft should never be out of position more than one-quarter mile. Over correcting with power and airspeed usually results in larger deviations. A heading and airspeed tolerance for lead to shoot for is +/- 2 degrees and +/- 2 KIAS. If a leader deviates from these tolerances for a significant time, he or she should notify the formation and correct back immediately.

18.10.2.4. Autopilot Operations. The autopilot should be used to reduce fatigue and aid in altitude separation. Consideration should be given to placing an aircraft with an inoperative or malfunctioning autopilot in last position in the formation for extended periods in formation.

18.10.3. Aircrews will monitor the position of all other aircraft and, notify any aircraft excessively out of position (i.e. inside 1/4 NM or outside 3 NMs). It is possible they are having equipment or performance difficulties.

18.10.4. Visual station-keeping techniques are described in **Figure 18.3.** During operational situations with EMCON 3 or 4 implemented and when marginal visibility prohibits normal formation spacing, a compressed trail formation may be required to avoid unnecessary emissions. Formations may be compressed, but should not be less than 1/2-NM spacing between aircraft. (Altitude separation may be compressed, but should not be less than 250 feet stacked up between aircraft during visual station keeping.)

18.10.5. Visual formation is authorized for B1B bombers and fighter aircraft only. During A/R, if any airplane initiates a breakaway, aircraft flying visual formation will remain with the tanker and remain clear of the descending receiver.

18.11. Mid-Mission Join-Ups. Mid-mission join-ups should be accomplished using standard A/R rendezvous procedures. En route, point parallel, or ATC directed rendezvous may be performed; a minimum of 1000 feet separation between aircraft and formations will be maintained during the rendezvous. During point parallel rendezvous, one aircraft will maintain centerline and the other must establish the offset and be the maneuvering aircraft. The route of flight after a mid-mission join-up should provide a sufficient straight leg beyond the planned rendezvous point to effect join-up.

18.12. Formation Position Changes (Figures 18.4 and 18.5). Changes in formation may be required for the purpose of changing lead or moving wingmen to a more opportune position for the purpose of mission accomplishment (such as moving an aircraft with inoperative radar to a position where following aircraft can monitor their position). The figures provide examples of 3-ship formation position changes. These procedures are also applicable for 2- through 6-ship formation position changes. Prior to executing any position change, the formation leader must ensure all formation members understand the procedures to be followed for intra-formation position changes. Formation position change procedures will be covered in the formation leader's briefing. ARTCC coordination is required prior to deviations from the approved flight path.

18.12.1. Formation position changes should only be accomplished in straight and level flight. Once initiated they will take priority over all other activities. Do not attempt to refuel receiver aircraft or

obtain individual ARTCC clearances during formation maneuver and position changes. Crews must plan ahead to allow sufficient time and airspeed to accomplish the position change.

18.12.2. Positive separation must be monitored and maintained during formation maneuvering and position changes. Prior to initiating the position change, lead will ensure that the aircraft to assume the lead is in a position from which the lead change can be safely initiated.

18.12.2.1. Altitude separation is the most critical element during position changes. Changes in altitude will be made only when lateral spacing is assured and coordinated on interplane frequency. Complete formation maneuvers and changes prior to initiation of other required mission activities. Particular care in maintaining separation must be exercised when transferring receiver aircraft from one tanker to another or when elements are joining and departing the formation.

18.12.2.2. Transferring receivers from one tanker to another during formation join-up and break-up must be coordinated with all participants and will be directed by the mission commander designated with responsibility for that phase of mission accomplishment.

18.12.2.3. Prior to initiating a formation position change, the formation leader will ensure sufficient straight and level time and airspace is available to complete the change.

18.12.2.3.1. TCAS, radar or visual contact must be maintained throughout the position change. If TCAS, radar and visual contact are lost during a position change, maintain altitude, advise formation lead contact has been lost. Ensure positive separation by any means available and do not attempt to rejoin the formation until positive TCAS, radar or visual contact is established. The last aircraft in the formation with operable radar, and all aircraft with operable TCAS, will monitor the position of other aircraft to ensure proper separation.

18.12.3. Aircraft changing positions will assume the call sign of their new intra-formation position (RED 1, RED 2, etc.) and formation leadership, if appropriate, when all aircraft are level at their new altitude and established in their new position. All aircraft will then acknowledge with their new intra-formation call sign. Aircraft will not change their individual call sign that is filed on the DD Form 175. Call sign of the flight will be the call sign of the lead aircraft or as directed by ARTCC. The new lead aircraft will squawk the assigned mode 3 or as directed by ARTCC.

18.12.4. The following procedures may be used to effect an aircraft lead or position change with other aircraft during VMC. All changes in heading, position, and altitude will be pre-briefed and coordinated on interplane frequency. When VMC cannot be maintained, use the procedures in figures 18.4 and 18.5.

18.12.4.1. Wingmen will maintain a minimum 1/2-mile in trail and descend or maintain 500-feet altitude separation. The aircraft to assume the lead will move laterally (normally to the right) ½-mile. Use 15 degrees of bank to turn 15 degrees from heading then turn back to heading using 15 degrees of bank. The wingman will accelerate and pass the leader. (Maintain 1/2-mile lateral separation.)

18.12.4.2. As the wingman passes the leader, they will assume lead responsibilities and climb, descend, or maintain altitude as required after positive visual separation is confirmed.

18.12.4.3. The new wingman (old lead) will obtain or maintain a 500-foot altitude separation as required, place IFF to standby, notify the new lead when approaching position in-trail, and confirm their altitude. At this time, the new leader will decelerate to briefed airspeed.

18.12.4.4. The wingman will assume trail position behind the leader and make a normal closure to proper position.

Figure 18.1. Visual Station-Keeping Techniques.

A.

A. At 2 NM and stacked up 500 feet, the top of the fuselage appears to be one third the way up the vertical stabilizer and the engines are easy to see as small circles under the wing.

B.

B. At 1 NM, the fuselage appears to be half way up the vertical stabilizer and the engines area still visible as circles but are tangent with the trailing edge of the wing. The trailing edge of the main wing appears to meet the leading edge of the horizontal stabilizer.

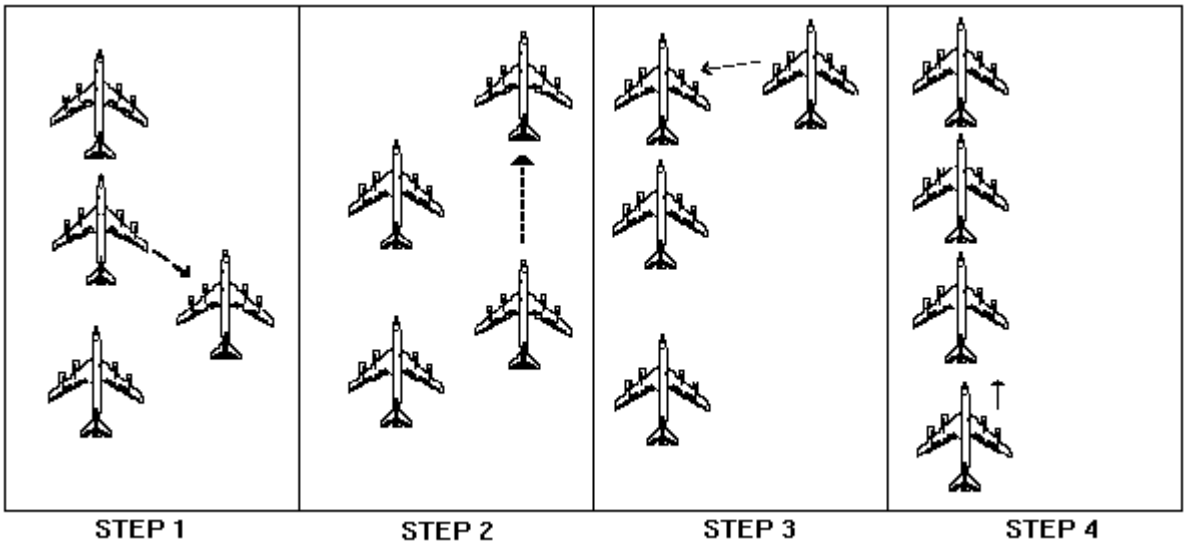
C.

C. At 1/2 NM, the fuselage is even with the top of the vertical stabilizer and the engines appear as half circles under the trailing edge of the wing. You will be able to see a slight amount of space between the trailing edge of the main wing and the horizontal stabilizer.

D.

D. At 1/4 NM, the top of the vertical stabilizer is well back on the fuselage, just forward of the leading edge wing roots and the engines are out of view. There is clear definition between the trailing edge of the main wing and the horizontal stabilizer.

Figure 18.2. Formation Position Change—Any Aircraft Moves to Lead.



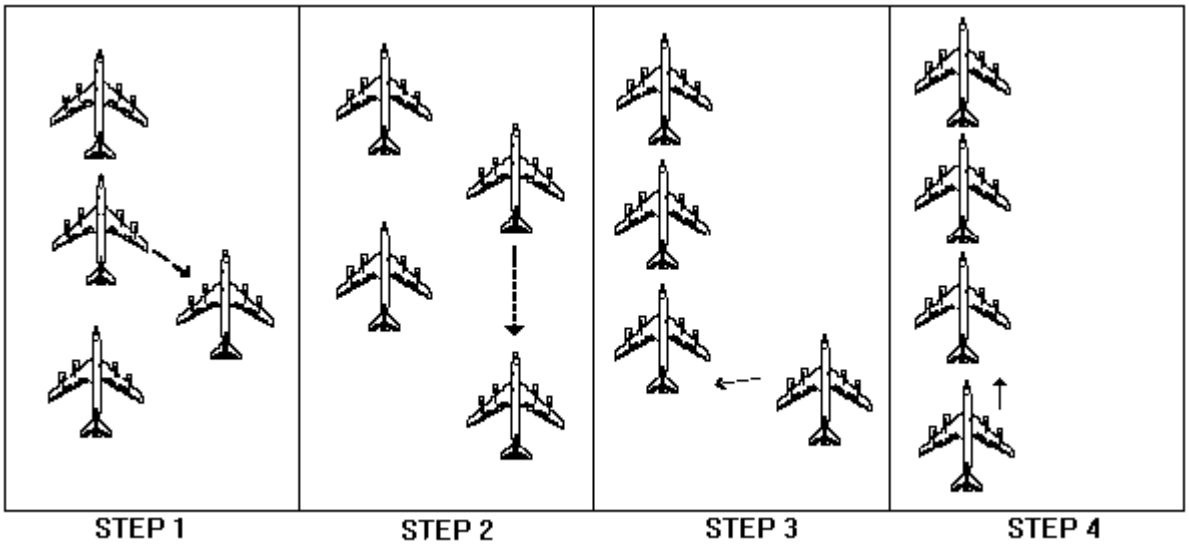
(STEP 1) Lead determines the aircraft or element to move forward (maneuvering aircraft). The maneuvering aircraft or element will echelon (normally right) using approximately 30 degrees of bank and turning 30 degrees from formation heading. When 30 degrees off heading, reverse the turn using approximately 30 degrees of bank and return to formation heading. This will provide an offset of approximately 2 NMs.

(STEP 2) After established in echelon, the maneuvering aircraft or element will accelerate forward, increasing airspeed a recommended 15 KIAS. The maneuvering aircraft or element should simultaneously resume formation airspeed and stabilize approximately 1 1/4 NMs forward range from the original lead. When the maneuvering aircraft or element is in the forward echelon position and positive visual or electronic contact is established, conduct the required altitude changes. ***NOTE:*** For 2-NM in-trail formations, the maneuvering aircraft or element will accelerate forward, increasing airspeed a recommended 30 KIAS. The maneuvering aircraft or element should simultaneously resume formation airspeed and stabilize approximately 1 1/4 NMs forward range from the original lead.

(STEP 3) The maneuvering aircraft or element will then move into lead position using no more than 15 degree heading corrections.

(STEP 4) If applicable, the formation will then establish proper aircraft spacing. The formation lead should be advised by the last aircraft after the formation is reformed. Assume new position call signs (RED 1, RED 2, etc.) and reset rotating beacon or strobe and navigation lights.

Figure 18.3. Formation Position Change—Any Aircraft Moves to Trail.



(STEP 1) Lead determines the aircraft or element to move aft (maneuvering aircraft). The maneuvering aircraft or element will echelon (normally right) using approximately 30 degrees of bank and turning 30 degrees from the formation heading. When 30 degrees off heading, reverse the turn using approximately 30 degrees of bank and return to formation heading. This will provide an offset of approximately 2 NM offset.

(STEP 2) After established in echelon, the maneuvering aircraft or element will decelerate toward the end of the formation, decreasing airspeed a recommended 15 KIAS. The maneuvering aircraft or element should simultaneously resume formation airspeed and stabilize approximately 3/4 NM aft of the last aircraft or element. When the maneuvering aircraft or element is in the aft echelon position and positive visual or electronic contact is established, formation lead directs required altitude changes.

NOTES:

For 2 NM in-trail formations, the maneuvering aircraft or element will decelerate toward the end of the formation, decreasing airspeed a recommended 30 KIAS. The maneuvering aircraft or element should simultaneously resume formation airspeed and stabilize approximately 1 3/4 NMs aft of the last aircraft.

(STEP 3) The maneuvering aircraft or element will then move into position using no more than 15 degree heading corrections.

(STEP 4) If applicable, the formation will then establish proper aircraft spacing. The last aircraft should advise the formation lead after the formation is reformed. Assume new position call signs (RED 1, RED 2, etc.) and reset rotating beacon or strobe and navigation lights.

18.13. Echelon Formation.

18.13.1. Echelon formation procedures are contained in applicable A/R manuals. Proper echelon spacing and angle should be maintained using radar or visual means. Echelon formation is normally

flown on lead's right wing. Formation lead may direct a different angle or spacing when weather or EMCON conditions dictate.

18.13.1.1. Assumption of Echelon in a Turn. Aircraft normally will assume echelon halfway through the rendezvous turn unless briefed or directed otherwise by formation lead. Following aircraft should maintain the same bank angle as lead and execute any airspeed changes simultaneously with lead. To move out in echelon, succeeding aircraft stop the turn at some heading short of lead's roll out heading. As an example, two may roll out 5 degrees short of heading, three 10 degrees, and so on. Aircraft will return to lead's heading as the proper echelon position is approached.

18.13.1.2. Assumption of Echelon in Straight and Level Flight. Assumption of echelon formation in straight and level flight should be accomplished by succeeding aircraft turning from formation heading in increments of 5 to 10 degrees. As an example, two may turn 5 degrees, three turn 10 degrees, four turn 15 degrees, etc.; aircraft will return to lead's heading as proper echelon position is approached.

18.13.2. Turns greater than 30 degrees into the echelon are permitted only in an emergency. Turns into an echelon are limited to 15 degrees of bank. All aircraft must execute the turn at the same time, or when time permits, start with the last aircraft, then the next to last aircraft, etc. If turns greater than 30 degrees are necessary for mission requirements, the formation leader should direct all aircraft to assume normal en route trail formation.

18.14. Air Refueling (A/R). During A/R, formation lead must fly precise airspeeds, altitudes and headings in order to maintain a stable platform for aircraft in the formation. Any deviation from these parameters requires corrections, which increase in magnitude with each succeeding aircraft. Therefore, formation aircraft should maintain their position relative to the lead aircraft. This prevents the "accordion" effect during A/R and possible conflict with other aircraft in the formation.

NOTE: Receivers with large on-loads at high gross weights may require airspeeds to build as on-load increases. Maintaining formation position in this scenario may be extremely difficult. If a precise airspeed platform cannot be achieved due to receiver mission requirements, crews must be especially diligent to monitor aircraft formation position relative to other formation aircraft and ensure adequate lateral separation is maintained. Formation leaders should plan for this eventuality and brief or coordinate actions to maintain formation integrity to the maximum extent possible. These procedures are in addition to procedures in the A/R manual.

18.14.1. Communication. The total number of aircraft on one frequency during formation and A/R may be quite high. This situation demands strict radio and interphone discipline. The formation leader will demand proper management of essential transmissions. Cockpit interphone and radio communications will be brief, if possible, and be made when the receiver is not closing to or in the contact position. Boom operator transmissions on refueling frequencies will be brief but adequate and include the entire call sign identification. If pre-briefed, call signs may be abbreviated, e.g. "Receiver one, this is tanker one," etc.

18.14.2. Anchor Air Refueling. Anchor A/R tracks or tracks requiring frequent turns should be flown in trail or offset trail (approximately 20 degrees echelon) rather than standard echelon formation. When flying in trail position, fly slightly outside of the proceeding aircraft's flight path. This will prevent the receiver from descending into the preceding airplane's wake turbulence during a breakaway.

Tankers should not climb in conjunction with a breakaway in a multi-aircraft, tactical rendezvous A/R environment, unless deemed necessary by the tanker pilot or boom operator.

18.14.3. Echelon Position. Tanker A/R echelon formation will vary depending on the ratio, number, and type of receivers, see A/R manual for specific procedures.

18.14.4. End Air Refueling (EAR). Tanker lead must ensure receiver aircraft arrive at EAR with their required offload, on time, with an ARTCC clearance, and in a safe position to leave the A/R formation. To accomplish this, tanker lead must thoroughly plan, brief, and monitor EAR mission requirements.

18.14.4.1. Tanker aircraft will not transit the receivers' altitude during EAR unless lateral separation and positive TCAS, radar or visual contact can be maintained. This helps ensure tanker aircraft do not pose a wake turbulence or collision hazard to receiver aircraft.

18.14.4.2. If the procedures above cannot be accomplished, the tanker will verbally coordinate with the receivers to ensure lateral separation prior to transiting the receivers' altitude.

18.14.5. Join-up. Receiver aircraft may join an existing refueling formation while A/R is being conducted at the authorization of the tanker formation leader. Receiver aircraft should use the following procedures:

18.14.5.1. Contact the tanker on A/R frequency to obtain permission to join the formation. Obtain heading, airspeed, and altitude information.

18.14.5.2. Contact the controlling ARTCC stating intentions and obtain clearance.

18.14.5.3. Joining aircraft should have positive radar contact by 5 NMs and must have positive visual contact by 1 NM.

18.14.5.4. Maintain an altitude 2000 feet below the base-refueling altitude until within 1 NM of the formation.

18.14.5.5. At 1 NM, notify the formation, climb, and control airspeed (maximum overtake within 1 NM is 50 KIAS) to arrive in position (observation, echelon or wing) on speed.

18.15. Radar or TCAS Failure. The formation leader will provide guidance should an aircraft experience radar or TCAS failure, which results in difficulty in weather avoidance or maintaining formation position.

18.15.1. During visual conditions, maintain formation position by visual means and notify the formation leader if instrument conditions are anticipated.

18.15.2. Radar Failure (without TCAS). During instrument conditions, maintain formation position using the trailing aircraft radar to assist in spacing. If conditions warrant, make a position change to place the aircraft with radar failure in front of an aircraft with operating radar. Formation position two is optimum for radar-out aircraft in a three ship or greater formation. Upon notification from a wingman of radar failure, the formation leader should immediately announce formation heading, airspeed, and altitude. The formation leader will maintain a stable platform on the announced heading, airspeed, and altitude until the situation is determined to be under control.

18.15.3. Radar Failure (with TCAS). If lead experiences a radar failure, designate a wingman to assume weather avoidance duties. If weather conditions warrant, make a formation position change to place the aircraft with radar failure to a wingman position.

18.15.4. TCAS Failure. During instrument conditions, make a formation position change to place the aircraft with inoperative TCAS in the lead position. During the position change, utilize an operable TCAS to ensure aircraft separation (some TCAS failures will not allow the malfunctioning aircraft to reply to other interrogators).

18.16. Complete Radio Failure. In the unlikely event of complete radio failure, maintain formation position by TCAS, radar or visual means and attempt to restore radio communications. The emergency radios contained in the aircraft's survival kits may be used for emergency communications.

18.17. Lost Wingman Procedures. These procedures are to be used when visual, radar, TCAS, or radio contact cannot be maintained and altitude separation can not be ensured. In any lost wingman situation, immediate separation of aircraft is essential to safety. Upon losing all contact with the leader, or if unable to maintain formation due to disorientation, the wingman will simultaneously execute the applicable lost wingman procedure while transitioning to instruments. The bank angle used to achieve separation should equal the number of degrees to be turned. Smooth application of control inputs is imperative to minimize the effects of spatial disorientation. Any aircraft, which can maintain contact with an aircraft executing a lost wingman maneuver will remain in formation with that aircraft until otherwise, directed by the leader. When lead is notified of a lost wingman, lead will take appropriate action, as the situation dictates, until positive separation is assured. Lead will establish a reference heading and altitude after initial separation is assured. During recovery, if the flight has a block altitude clearance, wingmen should establish appropriate altitude separation.

18.17.1. Two Aircraft Flights:

18.17.1.1. In wings-level flight (climbing, descending, or level) simultaneously transition to instruments, inform lead, turn 15 degrees away and maintain new heading for 15 seconds, then resume course. Adjust to formation or obtain separate clearance if required.

18.17.1.2. In turns (climbing, descending, or level):

18.17.1.2.1. On the outside of the turn, transition to instruments, roll to wings level and inform the leader. Continue straight ahead to ensure separation prior to resuming turn. Adjust to formation or obtain separate clearance as required.

18.17.1.2.2. On the inside of the turn, simultaneously transition to instruments to maintain established bank angle, reduce airspeed by 10 KIAS to ensure clearance, and inform lead. Lead will simultaneously roll wings level, maintain airspeed, and acknowledge wingman's call. If lead has acknowledged the lost wingman call and confirms he or she has rolled wings level, the wingman will, after 15 seconds, roll wings level, establish 500 feet altitude separation, turn to lead's referenced heading and attempt to acquire lead on radar. If loss of visual contact is not acknowledged by lead, maintain established bank angle, establish 500 feet altitude separation, roll out on new heading, attempt to acquire lead on radar, and form into en route formation position. If TCAS or radar contact cannot be re-established, obtain separate clearance from the controlling agency.

18.17.2. Three Aircraft Flights. If only one aircraft in the flight becomes separated, the procedures above would provide safe separation. However, as it is impossible for number three to immediately ascertain that number two still has visual contact with the leader, it is imperative number three's initial action be based on the assumption number two has also become separated. If number two is still in visual, TCAS, or radar contact, he or she will maintain position. If number two goes lost wingman, he or she will follow the procedures outlined above. Number three will follow the procedures listed below:

18.17.2.1. In wings level flight (climbing, descending, or level) simultaneously transition to instruments, inform lead, turn 30 degrees away, and maintain new heading for 30 seconds, then resume course. Adjust to formation or obtain separate clearances as required.

18.17.2.2. In turns (climbing, descending, level):

18.17.2.2.1. In the outside of the turn, simultaneously transition to instruments, inform lead and reverse direction of turn for 15 seconds to ensure separation from lead and number two. Adjust to formation or obtain separate clearance as required.

18.17.2.2.2. In the inside of the turn, simultaneously transition to instruments to maintain established bank angle, reduce airspeed by 20 KIAS to ensure clearance, and inform lead. Lead will simultaneously roll wings level, maintain airspeed and acknowledge the wingman's call. If lead has acknowledged the lost wingman call and confirms he or she has rolled wings level, number three will, after 30 seconds, roll wings level, establish 1000 feet altitude separation, turn to lead's referenced heading, and attempt to acquire lead and number two on TCAS and radar. If loss of visual contact is not acknowledged by lead, maintain established bank angle, establish 1000 feet altitude separation, roll out on new heading, attempt to acquire lead on TCAS and radar, and form into en route formation position. If TCAS or radar contact is not re-established, obtain separate clearance from the controlling agency.

18.17.3. Lost Wingman Procedures during Receiver A/R. Depending on the makeup of the A/R formation, it is possible that in the event of a breakaway, receiver aircraft may find themselves co-altitude with another aircraft in the formation. If, during a breakaway, the receiver aircraft loses sight of the tanker aircraft, T.O. 1-1C-1-14 requires the receiver aircraft to descend to an altitude 1000 feet below the tanker. In the event this places the receiver aircraft co-altitude with another aircraft in the formation, immediately coordinate a de-conflicted altitude with tanker lead. If unable to immediately contact tanker lead and visual, A/A TACAN, TCAS, radar, or radio contact with the co-altitude aircraft cannot be maintained, descend to an altitude that will provide positive separation from other aircraft and decrease airspeed to ensure lateral separation.

18.18. Formation Break-Up and Recover. Thoroughly plan and brief formation separation procedures in advance. Formations must be able to achieve vertical or horizontal spacing before they may expect ARTCC to assume responsibility for aircraft separation. **Do not initiate formation separation procedures without ARTCC approval**. Several techniques may be used to accomplish this.

18.18.1. Altitude. Aircraft planning on using the same published high altitude penetration may take altitude separation prior to the holding fix and then start the penetration in succession. Lead aircraft will not transit a trailing aircraft's altitude during formation break-up unless lateral separation and positive radar or visual contact can be maintained. This helps ensure leading aircraft do not pose a wake turbulence or collision hazard to trailing aircraft.

18.18.2. Separation Routing. Aircraft routing may be designed to provide formation spacing. This may be mission planned and filed as routing following the break-up point or be provided as ATC vectors. When planning a break-up for filing purposes, sufficient spacing can be provided by planning a turn between the break-up point and the initial approach fix. The spacing provided by the turn may be effectively increased by also providing differential airspeed during the maneuver. ATC may provide the same service during vectoring, but planning the mission properly can reduce ARTCC communications and preclude delay if ARTCC radar capability is lost.

18.18.3. Cruise Differential Airspeed: Differential airspeed may be effectively used to gain lateral separation if large distances are available. If each aircraft used 10 KIAS differential airspeed (at normal en route airspeed), a 7-10 NM spacing over a 200-NM distance will result.

18.18.4. Penetration Differential Airspeed. During penetration, the lead aircraft should maintain the highest airspeed, and if possible, delay configuration. Following aircraft should maintain lower airspeeds to further help increase separation. All aircraft must allow sufficient time to complete descent and before landing checklists.

18.19. Mixed Formations. Although standard formation procedures normally apply during mixed formations, consideration must be given to performance differences between participating aircraft. Wingmen must ensure all formation members know the performance characteristics of their aircraft. Mission profiles should be planned to minimize altitude conflicts during departure, en route, and formation breakup.

18.19.1. Launch, Departure, and Level-Off: Formation lead must determine the optimum sequence for launch of mixed aircraft formations based on performance, weather, airfield conditions, wake turbulence, and mission requirements. Normally, the fastest accelerating or highest climb speed aircraft should lead. However, wake turbulence considerations may require the lighter aircraft to launch first. In no case will the interval be less than those outlined in **Figure 18.2.** Formation leaders may increase the takeoff interval for adverse weather conditions or wake turbulence factors. If conditions require substantial increases in takeoff interval to ensure positive formation separation, formation takeoffs should not be accomplished and FLIP separation criteria apply. An en route or point parallel rendezvous should be planned. Fighter or fighter-type aircraft should normally takeoff before tankers. For planning purposes, if operational considerations necessitate fighters takeoff after the tankers, a 5-minute interval should be used and an en route rendezvous should be planned to effect join-up. With fighters launching first, aircraft may begin takeoff roll once fighters are airborne and past the departure end of the runway, as determined by formation lead. Departure airspeed and rate of climb will be pre-coordinated at the formation briefing. If during departure an intermediate level-off is necessary, avoid climbing through the wake turbulence of preceding aircraft. Altitude separation must be carefully monitored during closure to formation position. When safety and weather conditions permit, and, if briefed by formation lead, formation members may attempt to obtain formation spacing during climbout.

18.19.2. Climbs and Descents. Due to performance differentials, caution must be exercised if climbs or descents become necessary with mixed formations. One technique is to use a constant vertical velocity and constant indicated airspeed for climbs and descents. Procedures must be thoroughly briefed prior to flight.

18.19.3. Cruise:

18.19.3.1. Tradeoffs between optimum altitudes and airspeeds for aircraft type may be required to achieve maximum overall formation efficiency. Formation leaders will determine and brief the best cruise parameters consistent with mission requirements.

18.19.3.2. Wingman consideration is paramount during altitude or airspeed changes. Formation leaders must consider the most performance limited aircraft when making these changes.

18.19.4. Buddy Departures. Collocated tanker and fighter or bomber units may use buddy departures. The intent of this type departure is to facilitate the join-up of receivers with their mated tankers. It is especially useful for EMCON or restricted radio operations but must be coordinated with ATC prior to launch.

18.19.4.1. VMC procedures may be used when weather (ceiling and visibility) is 3000/5 or greater. These procedures are generalized and require modification based on aircraft and airspace limitations. Receivers will normally launch first and intercept an arc to place themselves on extended (approximately 10 NMs) final to the departure runway. When the receiver calls 10 NMs final or the last receiver turns cross wind, the tanker will launch, or the tanker will launch on predetermined timing. (For each additional tanker, add the distance flown by receivers in one minute to initiate tanker launch.) This will allow 4-NM separation between receivers and the last tanker in the launch stream. Continue with a straight-ahead rejoin or according to briefed departure routing. The entire formation should be rejoined within approximately 20 NMs of the departure field.

18.19.4.2. Under IMC or when weather is less than 3000/5, plan to rendezvous the formation at an orbit point along the route of flight. Tankers will normally launch first unless mission fuel load and performance considerations dictate otherwise with receivers following. Receivers should be rejoined prior to rendezvous with the tankers.

18.20. Mission Debriefing and Critique. The formation leader following the mission should conduct a complete mission debriefing and critique.

18.21. Formation Briefing Guide. This guide highlights mission events or objectives versus technical procedures. Use this guide as a standardized briefing format when flying with other units. Ensure briefing items will meet mission and EMCON objectives.

Table 18.3. Formation Briefing Guide.

1. **Roll Call and Time Hack**:
   Aircraft commander
   Call sign
   Aircraft number
   Parking locations
2. **Weather**:
   Takeoff
   En route
   A/R
   Destinations
   Alternates
3. **Mission Overview**:
   Objectives

Tactical considerations
Takeoff time
Rendezvous control time/point and ARCT
Formation break-up
Landing

4. **Communications and Plan**:
Ground operations:
EMCON plan or allowable emitters
Radio check-in times and secure radio checks
Authentication, launch, or execution as required
ARTCC clearances
Takeoff:
EMCON plan and allowable emitters
Interplane frequency
Airborne calls
En route:
EMCON plan and allowable emitters
Lost wingman
Weather update
Communications log requirements
SATCOM/HF
Air Refueling:
EMCON plan and allowable emitters
Radio frequencies
A/A TACAN channel and band
HF
Formation break-up and recovery:
EMCON plan and allowable emitters
Radio frequencies
Weather update
SATCOM/HF procedures
Special frequencies

5. **Taxi**:
Engine start time
Taxi time
Sequence (including spare)
Performance data
Takeoff Clearance

6. **Takeoff**:
Interval and sequence
Abort
Emergencies

7. **Departure (Visual vs. Instrument)**:
Airspeeds
Routing

Climb rates or power settings
Intermediate level-off
Turns and bank angles
Visual cut-off

8. **Level-Off**Join-up
Altitude block
Airspeed (indicated, true, or mach)
Minimum maneuvering airspeed
Performance ceilings

9. **En route (Visual Versus Instrumen**t):
Airspeed changes or mission timing
Turns and bank angles
Climb and descent rates
Position changes

10. **Air Refueling (A/R) (Visual vs. Instrume**nt):
Call signs
Off-loads, on-loads, and sequence
Base altitude
Track
Type rendezvous
A/R formation
A/R airspeeds
Bingo fuel
Abort bases
EAR requests
Break-up

11. **Formation Break Up:-**
Altitudes
Separation routing and procedures
Cruise differential airspeeds.

12. **Recovery:**
Penetration sequence
Airspeeds.

13. **Special Subjects:**
Wake turbulence avoidance
Mission commander designation (as applicable)
Aircraft separation and monitoring plan
Tactics (as required).

14. **Formation Debrief**

Chapter 19

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19.1. This chapter is not used for KC-135 operations.

Chapter 20

AEROMEDICAL EVACUATION (AE)

Section 20A—- General Information

20.1. Mission:

20.1.1. The primary function of the C/KC-135 aircraft for AE is transport of ill or injured DoD members and their dependents requiring medical support. These AE missions may be directed at any time. The C/KC-135 aircraft will be used with the concurrence of the appropriate medical validating authority.

20.1.2. AE personnel will utilize the procedures in applicable AFI/H 11-XXX and 41-XXX series, in conjunction with this publication, to accomplish the AE mission.

20.2. Not Used.

20.3. Waivers and Revisions:

20.3.1. Waivers. Use **Chapter 4** waiver protocol for AE related questions or waivers.

20.3.2. Revisions. Use **Chapter 1** protocol for improvement recommendations.

20.4. Aeromedical Evacuation Forms. Forms required will be per applicable AFI/H 11-XXX and 41-XXX series publications.

Section 20B—- Aeromedical Evacuation Command and Control

20.5. Operational Control and Reporting of Aeromedical Evacuation Forces:

20.5.1. HQ AMC is lead command for AE. The aircraft commander is responsible for ensuring the safety of the flight crew, AE crew, and all patients and passengers. The MCD is responsible for providing medical care to the patients. In matters concerning flight safety, decisions of the aircraft commander are final; in matters of patient care, decisions of the MCD are final.

20.5.2. Operational control of AE missions is the same as for other airlift missions.

20.5.3. The AMC Command Surgeon (HQ AMC/SG) is responsible for providing standards and procedures concerning the treatment of patients in-flight, and for approval of any medical equipment used on AE missions.

20.5.4. The MCD will advise the aircraft commander when a patient's condition or use of medical equipment may affect aircraft operations.

20.5.5. The AEOO, if available, is responsible for supervising flight line execution of AE missions. The MCD is directly responsible for the safety and medical well being of patients on the aircraft and coordinates enplaning and deplaning procedures with the AEOO and supporting agencies.

20.6. Aircraft Commander Responsibilities:

20.6.1. Assist the MCD in obtaining patient support requirements based on local availability. The MCD will coordinate with the aircraft commander for integration of the flight and Aeromedical Evacuation Crew Members (AECM) for continuing missions in which no crew changes take place including en route transportation, dining, billeting, etc.

20.6.2. Brief the AE crew on the mission, flight plan, flight profile, and current threat (if applicable).

20.6.3. Maintain cabin altitude at the level requested by the GPMRC/TPMRC, tasking AE command element, or MCD.

20.6.4. Coordinate with the MCD to determine if any flight restrictions are necessary due to patient conditions and if passengers and cargo may be carried.

20.6.5. Coordinate with the MCD to insure mission required equipment is available/installed as necessary.

20.6.6. Advise the AECMs of intentions to start engines, taxi, itinerary changes, in-flight difficulties, etc.

20.6.7. Brief the MCD on additional responsibilities of the flight crew.

20.6.8. During Aeromedical Readiness Missions (ARM), coordinate with the Mission Clinical Coordinator (MCC) on planned simulated emergencies and training activities.

20.6.9. Patients or passengers may visit the flight crew compartment per **Chapter 5** of this instruction. The control of patients rests with the MCD, while control of the passengers is the responsibility of the flight crew, in conjunction with the MCD.

20.6.10. Transmit load messages and radio transmissions to GPMRC/TPMRC or tasking AE command element/ground personnel as requested by the MCD.

20.6.11. Coordinate Crash/Fire/Rescue (CFR) vehicle requirements when transiting airfields that are unfamiliar with AE requirements. CFR vehicle will stand by per AFI 32-2001, *The Fire Protection Operations and Fire Prevention Program,* and T.O. 00-25-172, *Ground Servicing of Aircraft and Static Grounding/Bonding*.

20.7. Flight Crew Responsibilities:

20.7.1. Assist the AE crew with aircraft systems.

20.7.2. Provide AECMs who are not qualified in the C/KC-135 with information identified in paragraph **20.10.1.**

20.7.3. Coordinate an emergency evacuation plan with the MCD.

20.7.4. Operate aircraft systems, i.e.; doors, ramps, emergency exits, etc.

20.7.5. Assist the AE crew as necessary, providing such assistance does not interfere with primary duties.

20.7.6. Operate galley and prepare food and beverages for food service provided to patients by AECMs.

20.7.7. Assist with aircraft configuration for AE operations.

20.7.8. Complete pre-flight/emergency briefings.

20.8. Aeromedical Evacuation Crew Responsibilities:

20.8.1. Primarily responsible for patient activities.

20.8.2. Assist flight crew/maintenance with aircraft configuration for AE operations.

20.8.3. Install and remove medical equipment/supplies.

20.8.4. Assist the boom operator with observation and care of passengers when it doesn't interfere with primary duties.

20.8.5. The MCD or designated AECM should be on aircraft inter-phone (headset) for all phases of flight, and will be on aircraft inter-phone during critical phases of flight to include takeoff and landing.

20.8.6. If C/KC-135 qualified/certified, provide AECMs who are not qualified/certified in the C/KC-135 with information identified in paragraph **20.10.1.**

20.9. Patient Death In-Flight. When a suspected death occurs in-flight, the planned itinerary will not be interrupted if the next scheduled stop is a US military airfield. If the next stop is a civilian airfield that does not service a US military medical facility, or a foreign military airfield, that stop will be over flown (mission requirements allowing). Coordination with command and control agencies is essential. The GPMRC/TPMRC or tasking AE command element must ensure that the MTF anticipating the aircraft's arrival at the civilian/foreign military airfield is informed of the cancellation.

Section 20C—- Aeromedical Evacuation Crew Complement and Management

20.10. Aeromedical Evacuation Crew Complement:

20.10.1. Aircrew Qualification. AECMs must be fully qualified on at least one of the following aircraft; C-9, C-17, C-130, or C-141, and are authorized to log primary flight time while performing duties on AE missions. Prior to being utilized as a certufued AFCM on C/KC-135 aircraft, AECMs must receive training as directed in AFI 11-2AE, Volume 1. A flight crewmember is ultimately responsible for emergency egress and cabin safety.

20.10.2. Crew Complement. A basic AE crew consists of two FNs and three AETs. An alert crew consists of one FN and two AETs. An augmented AE crew consists of one additional FN and AET. The group/squadron chief nurse can adjust crew complement. The group/squadron chief nurse is the final authority for increasing or decreasing the number of AECMs assigned to AE missions. Physicians, nurses, medical technicians, or other personnel designated as medical attendants (i.e., Critical Care Air Transport Team (CCATT) members) to specific patients does not constitute an augmented AE crew and does not extend crew duty time. Basic crews will not be augmented after crew duty has started.

20.10.3. The appropriate GPMRC/TPMRC or tasking AE command element will notify the command and control agencies or flying organization operations officer of the AE crew complement for each AE mission on C/KC-135 aircraft.

20.11. Aeromedical Evacuation Crew Management. AECMs will be managed per **Chapter 3** of this instruction.

Section 20D—- Aeromedical Evacuation Aircrew Procedures

20.12. Checklists:

20.12.1. General. This instruction and AFI 11-215 set policy and provide guidance for the standardization of contents and maintenance of flight crew checklists. Checklists will be maintained per AFI 11-215 and applicable MAJCOM supplement.

20.12.2. Applicability. This instruction applies to all AECMs assigned to AMC and AMC-gained AE units. It also applies to theater assigned AECMs performing AE duties on the C/KC-135 aircraft.

20.12.3. During all aircraft operations, AECMs will carry and use the guidance contained in their current abbreviated flight crew checklist.

20.12.4. Only MAJCOM/DO and SG approved inserts/briefings pertaining to crew positions will be kept in the abbreviated flight crew checklist binders.

20.12.5. Information in the AECM checklists will not be changed except by published revisions or changes.

Section 20E—- Aeromedical Evacuation Airlift Operations

20.13. General:

20.13.1. Determining Factors. Consider the following factors when transporting patients on the C/KC-135 aircraft; patient's diagnosis, condition, equipment, oxygen requirements, in-flight time, in-flight patient care requirements, and the number of medical personnel required. Emphasis must always be on providing quality and appropriate care while minimizing potential risks during transport.

20.13.2. Patient Load Planning Factors. The GPMRC/TPMRC or tasking AE command element determines the size/composition of the patient load on AE missions. AE mission planning factors will be per applicable AFI/H 11-XXX and 41-XXX series publications.

20.13.3. Patient Preparation. A flight surgeon, if available, will determine the patient's suitability for AE on the C/KC-135 aircraft. Medical authorities requesting the patient's evacuation must be informed of the in-flight physical stress on the patient. If the MCD determines the patient's medical condition is beyond the capability of the AE crew or aircraft, they will contact the GPMRC/TPMRC or tasking AE command element for further guidance. The MCD, in coordination with the appropriate theater medical validating authority, may refuse to accept any patient whose medical condition is beyond their capability. The MCD will advise the AC when a patient's condition or use of medical equipment may affect aircraft operation.

20.13.4. Equipment for AE Missions. Prior to use onboard AE missions, all medical equipment must be tested and deemed air worthy, and then approved for use by HQ AMC/SGX. All AE equipment currently approved by HQ AMC/SGX for use in the AE system has been reviewed by the KC-135 System Program Office (OC-ALC/LCM) at Tinker AFB, OK and has been found acceptable for use in Fuel Vapor Bearing Area (FVBA). All future equipment approved for use within the AE system will be required to meet FVBA test requirements as part of the AE equipment air worthiness certification process. For those unique patient moves requiring equipment that has not met the above criteria, contact GPMRC/TPMRC or tasking AE command element. GPMRC/TPMRC or tasking AE command element will obtain approval prior to use onboard the aircraft (applies to that specific mission only). AECMs are responsible for all medical supplies and equipment.

20.13.5. Aircraft Security. See **Chapter 7** of this instruction.

20.14. En Route Diversions:

20.14.1. The MCD is the medical authority onboard all AE missions and has the responsibility to determine what is beneficial or detrimental to the patient(s). If a physician is onboard, as an attendant to a patient, they will make decisions involving that specific patient's care and may be consulted for advice as appropriate. Specific procedures are contained in applicable AFI/H 41-XXX series.

20.14.2. Should a diversion become necessary due to a change in patient's condition, the aircraft commander will make every effort to comply with the requests of the MCD. Establish communications with the responsible command and control agencies, who will relay the information to the appropriate GPMRC/TPMRC or tasking AE command element.

20.14.3. Should an en route diversion become necessary for reasons other than a change in patient's condition, the aircraft commander will coordinate with the MCD before deciding the point of landing. The welfare of the patients is a prime consideration in all such decisions; however, safety is the final determinant. The aircraft commander notifies the responsible command and control agencies of the diversion and requests the appropriate medical agencies be notified.

20.14.4. Normally, patients will be advised of changes in itinerary and reasons for the diversion.

20.14.5. If the MCD determines the diversion will be detrimental to a patient, or the aircraft commander determines the diversion to be unsafe, the command and control agencies will be advised and guidance requested.

20.14.6. ARMs are the primary means of preparing for AE airlift. These missions can be diverted to fulfill "real" versus "simulated" patient airlift requirements. All medical equipment/kits will be kept operationally ready at all times. The Portable Therapeutic Liquid Oxygen (PTLOX) system, when mission ready, will be filled with LOX. **EXCEPTION:** The PTLOX system, when mission capable, will be maintained with nitrogen IAW T.O. 15X-2-8-1, *Liquid Oxygen Converter Type CRU-87/U.*

20.14.7. Opportune Airlift. Opportune airlift is preferred to launching a special airlift aircraft. The appropriate GPMRC/TPMRC or tasking AE command element and airlift agency should direct the move. Use of opportune airlift is considered an unscheduled AE mission, and managed/reported in the same manner as any other AE mission, to include the change of the mission number when patients are onboard. AECMs on these missions will either be qualified/certified or under supervision while gaining qualification/certification in the affected aircraft.

20.15. Ground Operations:

20.15.1. Engines should be shut down during enplaning and deplaning of patients.

20.15.2. Enplaning and Deplaning Considerations.

20.15.2.1. A K-loader or elevator truck may be used to enplane or deplane litter or ambulatory patients via the cargo door. When using a K-loader, remove pallets and rollers and ensure one AECM accompanies the patients.

20.15.2.2. If available, a stair truck may be used to enplane or deplane ambulatory patients.

20.15.3. Ambulatory patients may be enplaned or deplaned via staircase if available.

20.16. Refueling Operations:

20.16.1. The aircraft will be refueled before enplaning patients. Servicing will be per AFI 32-2001 and T.O. 00-25-172.

20.16.2. Do not conduct concurrent servicing during aeromedical evacuation missions.

20.17. Aircraft Pressurization: Normally altitude restrictions are passed from the GPMRC/TPMRC or tasking AE command element to command and control agencies for flight planning purposes. The MCD will advise the aircraft commander of any new cabin altitude or rate of cabin altitude change restrictions during the pre-flight briefing update.

20.18. Aircraft Configuration:

20.18.1. On opportune or dedicated AE missions, configure the aircraft during pre-flight.

20.18.2. Litter Support Provisions. None on C/KC-135 aircraft.

20.18.2.1. Patients may be floor loaded with standard cargo tiedown straps, in coordination with the boom operator.

20.18.2.2. Do not place litters in front of overwing exits or on top of floor emergency doors marked in red, yellow, or black.

20.18.2.3. Maximum floor loaded litter capacity is eight patients. Maximum ambulatory capacity depends on aircraft configuration.

20.18.3. Available litter spaces and ambulatory seating will depend on the aircraft cabin's mission configuration.

20.18.4. Electrical Power. 110 VAC/400 HZ, 30 amp electrical power is available from the galley electrical outlet. This outlet does not provide sufficient power (amperage) to operate the electrical frequency converter. Do not operate the electrical frequency converter from this outlet. The Electrical Cable Assembly Set (ECAS) does not provide an adapter (pigtail) for use with the galley outlet. Use only C/KC-135 galley pigtail adapters designed by HQ AMC/SG. These adapters will be procured through your local avionics shop. Use the ECAS extension cables to distribute 110 VAC/400 HZ electrical power to patient positions.

20.18.5. Therapeutic Oxygen**.** Therapeutic oxygen is not available on the aircraft and must be brought on board for patient use. Use the PTLOX system or compressed oxygen cylinders.

20.18.6. In the event of an emergency, ambulatory and litter patients will utilize the Passenger Oxygen Kit (POK).

20.18.7. AECMs will have portable oxygen available. AECMs will use an MA-1 portable oxygen bottle, or equivalent, which will be secured near their assigned seat.

20.18.7.1. AE units will not maintain MA-1 portable oxygen bottles. MA-1 portable oxygen bottles must be functionally located to ensure proper maintenance, servicing, and storage. Dash 21/ Alternate Mission Equipment (AME) shops ensure MA-1 portable oxygen bottles are serviceable and properly maintained, tested, and stored. Dash 21/AME personnel ensure additional MA-1 portable oxygen walk around bottles are available for each AE crew member flying in a primary crew position on AE missions.

20.18.8. Do not secure aircraft or medical equipment adjacent to an emergency exit in a manner that will prevent or impede egress.

20.18.9. Life Preservers**.** MB-1 flotation devices should be used for litter patients. If unavailable, use the Adult/Child life preserver for litter patients.

20.18.10. Patients not normally transported on the C/KC-135 aircraft:

20.18.10.1. Critical prognosis requiring extensive patient care or medical equipment, i.e., burns or multiple trauma.

20.18.10.2. Respiratory problems requiring large amounts of therapeutic oxygen, ventilator support or frequent suctioning.

20.18.10.3. Patients with contagious illness.

20.18.10.4. Floor loaded patients with external devices dependent on gravity, i.e.; foley catheters or chest drainage systems.

20.18.10.5. High risk neonates without special medical supervision from a neonatal team.

20.19. Passengers and Cargo.

20.19.1. The aircraft commander, with the concurrence of the MCD, will ensure maximum aircraft utilization for passengers and cargo. Passenger restrictions based upon patient considerations will be identified when seats are released. At stations with an GPMRC/TPMRC or tasking AE command element, the AEOO/GPMRC/TPMRC or tasking AE command element will advise the appropriate command and control agencies on the number of seats available for passengers.

20.19.2. Cargo and passengers may be carried with patients unless a clear detriment to the health and well being of the patient or passengers can be demonstrated. The decision will be made by the MCD, considering the need for maximum utilization of the aircraft. Conflicts will be referred to the respective GPMRC/TPMRC or tasking AE command element for a decision. Litters will be positioned forward of cargo pallets (if possible). If cargo is in place, and the aircraft commander and MCD agree, patients may be transported aft of the cargo.

20.19.3. Cargo will not be bumped except in unusual/abnormal cases, and only after the MCD has coordinated with the aircraft commander and notified the local GPMRC/TPMRC or tasking AE command element.

20.19.4. Do not move ambulatory patients to litters in order to provide seating for additional patients or passengers.

20.19.5. When required/mission load permits, a minimum of one seat will be reserved for every three litter patients on all AE missions. A minimum of two litters will be set up for ambulatory patient use on mission legs scheduled to exceed four hours in length. In addition, an emergency litter will be set up on all AE missions.

20.19.6. Hazardous cargo will not normally be transported aboard AE missions except in extreme circumstances.

20.20. Crash/Fire/Rescue.

20.20.1. Aircraft carrying patient(s) will be provided CFR protection per T.O. 00-25-172. Stand-by CFR vehicle is not necessary during normal operations. A CFR vehicle can be available upon request. The flight crew will coordinate CFR requirements.

20.20.2. At non-AMC bases, non-U.S. military bases, and civilian airfields, the controlling agency will coordinate the CFR coverage, as necessary. The request for CFR vehicle coverage may be denied. This will not prevent refueling operations from occurring.

20.21. AE Call Sign/Use of Priority Clearance.

20.21.1. For AE missions, use the call sign "Air Evac" followed by the five digit aircraft number (i.e., Air Evac 12345) or mission designator (as required by FLIP). Revert to standard call sign when the AE portion of the mission is completed.

20.21.2. The AE "priority clearance" will be used when carrying patients classified as "urgent" or "priority," who require urgent medical attention. AE priority will only be used for that portion of the flight requiring expedited handling. Aircraft commanders should request priority handling if AE missions are experiencing long delays during takeoff or landing phases, that will affect a patient's condition.

20.21.3. This does not allow use of AE priority status simply to avoid Air Traffic Control (ATC) delays, make block/departure times, or avoid inconveniences. ATC agencies do not question the motive when an AE priority is declared. Use this status judiciously.

20.22. Load Message.

20.22.1. At DoD military bases, the flight crew will pass inbound load messages to the proper command and control personnel. At civilian airfields, ground control will be notified.

20.22.2. The MCD will complete an AF Form 3858, **C-130/C-141 Aeromedical Evacuation Mission Offload Message**, per procedures in applicable AFI/H 41-XXX series.

20.23. Change in Patient Status. Change in patient status will be managed per applicable AFI/H 41-XXX series.

20.24. Aerial Refueling (A/R). A/R is an option, which should be considered when planning urgent, or priority patient airlift missions. A/R is not desirable in all medical situations, and in some cases may be detrimental to patient(s). Approval of A/R must be obtained from HQ AMC/SG prior to mission set up.

Chapter 21

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21.1. This chapter is not used for KC-135 operations.

Chapter 22

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22.1. This chapter is not used for KC-135 operations.

Chapter 23

AIRCREW CHEMICAL OPERATIONS AND PROCEDURES

23.1. Wear of Aircrew Chemical Defense Ensemble (ACDE). Wearing the ACDE will constrain normal aircraft operations. The ACDE includes the newer Aircrew Eye-Respiratory Protection System (AERPS) above the shoulder system and the CWU-66/P or -77/P Integrated Aircrew Chemical Coverall (IACC). Procedures and equipment have been tested under restricted conditions, and "business as usual" will not be possible. Individual situations dictate what can and cannot be done. To properly adapt, aircrews must understand hazards involved and the limitations of their chemical defense equipment.

23.1.1. This volume is intended to enhance other aircrew chemical defense training and provides the crewmember a basic understanding of utilizing ACDE in a chemical-biological threat area (CBTA). It combines information from technical orders and unit inputs to form a single source document.

23.1.2. This volume briefly describes the nature of the chemical threat and agents that may be faced. Secondly, it discusses some of the situations and problems the aircrew may encounter in a CBTA. Preparatory actions and countermeasures are examined so the crewmember can make optimal use of the ACDE and fly the mission safely. While the information presented may need to be modified, the specific objectives of this volume will help prepare the aircrew member for the unique challenges imposed by chemical weapons.

23.2. Factors Influencing the Chemical Warfare (CW) Agent Hazard:

23.2.1. The major instance in which a crew may be exposed to chemicals is through inhalation, absorption through the skin, eyes, and ingestion. Contaminated drink and food are considered harmful, but immediate concerns must be contamination avoidance to the maximum extent, limit exposure of the skin and eyes, as well as avoid breathing the contaminants. Factors affecting persistence are weather, agent physical characteristics, method of dissemination, droplet size, and the terrain.

23.2.2. Weather. Factors include temperature, wind, humidity, precipitation and atmospheric stability. For example, high winds and heavy rains reduce the contamination hazard. Conversely, lack of wind, overcast-skies, and moderate temperatures favor persistence.

23.2.3. Agent Dissemination. Disseminated as vapors, aerosols, or liquids. Solids seem unlikely, but agents may become solids at lower temperatures.

23.2.4. Agent Droplet Size. Persistence factor is determined by droplet size. Agents may be mixed with other chemicals “thickeners”, and form large drops making removal more difficult.

23.2.5. Surface and Terrain. CW agent clouds tend to follow the terrain, flowing over countryside and down valleys. Chemicals persist in hollows, depressions, and other low areas. Rough terrain retards cloud movement. Flat countryside allows a uniform, unbroken cloud movement. Vegetated areas are more contaminated than barren terrain. Liquid agents soak into porous surfaces, making evaporation much slower than for nonporous surfaces.

23.3. Categories of Chemical Warfare Agents. CW agents having military significance may be categorized as nerve, blister, choking, and blood. Because they are produced biologically, toxins technically are not chemical agents. However, they are considered a potential CW threat.

23.4. Nerve Agents:

23.4.1. Military Significance. Nerve agents are the most lethal and fastest acting of the standard CW agents. These agents affect the nervous system and are highly toxic whether inhaled, ingested, or absorbed through the skin. Persistency ranges from hours to many days.

23.4.2. Symptoms of Exposure. Nerve agent exposure is difficult to distinguish. Normally, symptoms of nerve agent exposure appear in the following order. Initial exposure includes a runny nose, tightness of the chest, dimness of vision, and pinpointing of the pupils. These symptoms are usually followed by difficulty in breathing, drooling, involuntary defecation and urination. Finally, exposure will lead to confusion, drowsiness, convulsions, coma and death.

23.4.3. Onset of Symptoms. Lethal respiratory dosages will cause death in 1 to 10 minutes and liquid exposure to the eyes will kill almost as rapidly. Depending on factors such as the amount and type of nerve agent, absorption through the skin may cause death anywhere from 1 to 2 minutes to 1 to 2 hours. The body retains nerve agents for an extended period; thus intermittent, cumulative exposure to low amounts can lead to the same ultimate effect as a single exposure to a higher amount.

23.4.4. Protection. The full protective ensemble is effective against nerve agents. When properly worn, the various chemical protective masks prevents inhalation of nerve agents. Both the aircrew coveralls and ground crew ensemble provide limited protection to the skin. All layers of the outer garment must be protected against saturation of liquids, chemical agents, water, or petroleum.

23.4.5. Antidotes/Prophylaxis. Antidotes are effective in combating effects of nerve agent exposure. These antidotes may be effective if given to a victim having advanced symptoms, and as long as the victim is made to continue breathing. People who use the antidotes must be seen by medical personnel and may not be combat-ready for several days. Currently, nerve agents are the only agents there is an available field antidote. This antidote can be self-administered by the exposed individual or through self-aid buddy care. In addition, medical personnel have more specialized treatments available.

23.5. Blister Agents:

23.5.1. Military Significance. Blister agents are dispensed as vapors or liquids, and may be encountered as solids. These agents primarily affect the eyes, respiratory tract, and the skin.

23.5.2. Symptoms of Exposure. Placed on the skin, a drop the size of a pinhead can produce a blister one inch in diameter. This action is accentuated by moisture; hence, a more severe danger is present during periods of sweating. The groin and armpits, which tend to be sweaty, are especially susceptible to blister agents. Blister agents, which come in contact with the eye lead to redness, watering of the eyes, blurring of vision, sensitivity to light, and frequently, blindness. Inhalation causes serious damage due to burns and blisters to the mouth, nose, throat, and lungs. Incapacitation may last for days or weeks; aircrews will probably be unable to fly for indefinite periods. After hospitalization, complications from blister agent exposure can arise and may be fatal.

23.5.3. Onset of Symptoms. Blister agents are quickly absorbed through the skin. However, it usually takes several minutes (up to five minutes and as long as several hours) for the symptoms to appear. They act most rapidly in liquid form, but are also effective in vapor form.

23.5.4. Protection. The full protective ensemble is effective against blister agents. Exposed areas must be cleaned thoroughly immediately after exposure. Blister agents are easily transferred from contaminated surfaces, thus great care must be taken to avoid contact with any contamination.

23.6. Choking Agents:

23.6.1. Military Significance. These agents are disseminated as vapors and when inhaled affect the respiratory system by damaging the lungs. Persistence is very brief, and dissipate rapidly (within minutes) under most field conditions.

23.6.2. Symptoms of Exposure. Choking agents cause coughing, choking, tightness of the chest, nausea, headache, and watering of the eyes. Choking agents can be lethal, with death normally from the lungs filling with fluids, making breathing difficult or impossible.

23.6.3. Onset of Symptoms. Exposure to choking agents has an immediate effect. Victims experience slightly delayed effects, such as painful cough, breathing discomfort, and fatigue.

23.6.4. Protection. Both the aircrew and ground crew protective mask is extremely essential to protect against exposure; the entire protective ensemble should be used as directed.

23.7. Blood Agents:

23.7.1. Military Significance. Blood agents are usually dispensed as vapor or aerosol and inhaled. Under most field conditions they may briefly persist on target (up to 10 minutes).

23.7.2. Symptoms of Exposure. Exposure to a single breath of blood agent causes giddiness, headaches, confusion, and nausea. As dose increases, breathing becomes more difficult. The victim will have deep, uncontrollable breathing and cramps, then loss of consciousness. Death is certain if the victim receives no medical aid.

23.7.3. Protection. Blood agents are breathing hazards. The full ensemble is most effective because the mask provides the breathing protection needed.

23.7.4. Additional Threats. Blood agents will damage mask filters. All personnel must change mask filters at the earliest possible opportunity after a blood agent attack.

EXCEPTION: Filters installed in aircrew CRU-80/P filter packs will be removed and replaced by aircrew life support (ALS) personnel (AFSC 1T1X1).

23.8. Aircrew Operations. Performance of duties while wearing chemical defense equipment can be extremely physically and mentally demanding. Special preparation and crew coordination are required to operate under chemical conditions. The information presented here will enable the aircrew to successfully operate in a chemical environment by recognizing limits and exploiting the capabilities of the chemical defensive equipment.

23.8.1. Planning:

23.8.1.1. Non-flying Ground Operations. Ground operations can represent the highest threat to aircrew safety. Protection from enemy attacks and exposure to liquid chemical agents is paramount. Aircrew should be advised to limit activities to essential duties only, and to separate ground duties from air duties. The ground ensemble is designed for quick donning and heavier levels of concentrations that can be more evident during ground operations. The aircrew ensemble

is designed for the unlikely event of light concentration levels, that could be found during flying operations and transmitted to and from the aircraft. Also, ACDE requires care during donning using "buddy dressing" procedures and ALS expertise during aircrew contamination control area (ACCA) processing.

23.8.1.2. Equipment Limitations. Due to thermal stress and the degraded performance associated with wearing of the ACDE, it is highly desirable to minimize the time and number of personnel exposed to chemical agents. Aircrew members must be familiar with limitations of the ACDE and properly plan their duties. ACDE is designed to protect against vapor agents only and the mask and hood assembly can not be donned quickly in time of attack.

23.8.1.3. Body Temperature/Fluids Control. Heat stress and dehydration are serious hazards while wearing the ACDE. Aircrew members need to control perspiration rates and limit activities to essential duties only. The need to consciously slow the work pace while performing physical labor, share workloads and monitor each other's physiological condition is essential.

23.8.1.4. Breathing Restrictions. One of the inherent characteristics of the filter assembly is moderate breathing resistance. Normally, this is most noticeable during high flow rates. For example during physical exertion, users should be aware of the possibility of hyperventilation. During flying operations resistance can be reduced by using the EMERGENCY position on the oxygen regulator. The valsalva maneuver cannot be performed while wearing the MBU-13/P mask, therefore alternate means such as yawning or chewing can be used. If these are unsuccessful, attempt to clear ears by holding the oxygen regulator in the TEST MASK position and forcefully exhale or yell against the regulator pressure. The new AERP mask/hood assembly incorporates a blower system that presents less-than-moderate breathing resistance. However, in the event of a blower system failure, aircrews will experience an increase in breathing resistance.

23.8.1.5. Limited Dexterity. Wearing three pairs of gloves restricts dexterity, therefore visual confirmation of switch selection/positioning becomes very important.

23.8.1.6. Restricted Communications. Normal communications are limited while wearing the chemical defense mask. Using the mini-amplifier/speaker with the AERP can enhance communications and some of the newer ground masks may be issued with built-in amplifier. Otherwise, visual signals and the aircraft's public address system can be used to compensate.

23.8.1.7. Peripheral Visions Limits. The aircrew chemical defense mask may reduce peripheral vision as much as 15 percent.

23.9. Limitations. Aircrews must be mentally prepared to face the dangers of chemical weapons. Flight planning must be thorough and aircraft commanders should emphasize chemical defensive operations during mission planning, hazards and countermeasures, plans for onload/offload in the event of a ground attack, and plans for the return leg in the event of a contaminated aircraft. Alternate scenario plans should also be considered in the event conditions change.

23.9.1. Fuel Requirements. Extra fuel may be needed to compensate for altitude restrictions as the result of chemical agent exposure. If the aircraft has contamination, follow procedures outlined in paragraph 16. During purge periods, the aircraft will be unpressurized. Although the aircrew can use the aircraft oxygen systems, passengers wearing the ground crew ensemble (GCE) cannot. This restricts the aircraft cruise altitude and increases fuel requirements.

23.9.2. Oxygen Requirements. Operating into a CBTA will increase oxygen requirements. The aircrew may be required to rely on the aircrew chemical defense mask and aircraft oxygen system to counter actual/suspected chemical contamination. Using the 100 percent oxygen setting offers the greatest protection in a contaminated environment. Appropriate oxygen reservoir levels must be planned to meet higher consumption rates. Use the aircraft -1 charts to calculate the required reservoir levels.

23.9.3. Mask/Filter Assembly Limitations. Wearing any of the chemical defense masks/filter assemblies imposes the following limitations:

23.9.3.1. The mask/filter assembly prevents the detection of fumes from fuel, hydraulic fluid and oil.

23.9.3.2. The filter assembly will not protect the user against ammonia fumes and carbon monoxide gas.

23.9.3.3. The filter/mask assembly should not be used without an oxygen source in an oxygen deficient atmosphere.

23.10. ACDE Issue. Aircrews will be issued sized ACDE and GCE at home station. Aircrews will ensure their ACDE and GCE is available at all times while in a CBTA. During deployments, at least one ACDE and one GCE will be issued to each crewmember as directed by the unit commander, TACC, or AMOCC. ALS technicians will prepare and issue mobility ACDE "D" bags for aircrew members (see AMCI 11-301, *Aircrew Life Support (ALS) Program* (chapters 4 and 6 or appropriate MAJCOM instruction). Mobility processing personnel will issue GCE "C" bags. Aircrew members will confirm the mobility bag contents and correct sizes.

23.11. Operations in a Chemical-Biological Threat Area (CBTA):

23.11.1. Establishing Threat Level. Aircrews should monitor command and control channels to ensure they receive the latest information concerning the destination's alert condition. Diversion of AMC aircraft to alternate "clean" locations may be required, unless operational necessity dictates. The local AMC Command and Control will direct aircrews to undergo medical pre-treatment for chemical exposure.

23.11.2. Protective Equipment Postures. Standardized USAF alert conditions and recommended ACDE requirements are listed below based on a chemical-biological threat. ***NOTE:*** These alarms may be different based on the host country requirements.

23.11.2.1. "ALL CLEAR" Attack is not probable, nor is chemical-biological contamination present. Notification--Verbal; removal of warning flags/placards. ACDE requirements--equipment is issued, prepared for flying, and kept readily available. GCE requirements--equipment is issued, prepared, and readily available.

23.11.2.2. "ALARM YELLOW" Attack is probable. Notification--Verbal; posting of yellow warning flags/placards. ACDE requirements--if en route to fly or during flying operations, all components will be worn except mask and hood, gloves, overcape, and overboots. GCE requirements--appropriate components should be worn with the mask/hood immediately available commensurate with ground duties.

23.11.2.3. "ALARM RED" Attack is imminent or in progress. Notification--Verbal; posting of red warning flags/placards; one minute warbling tone on siren (3 seconds on-1 second off). ACDE requirements--full ACDE will be worn for flying duties. GCE requirements--full ensemble should be worn commensurate with ground duties. Personnel will take immediate cover.

23.11.2.4. "ALARM BLACK" Contamination is suspected or present. Notification--Verbal; "Gas - Gas - Gas"; posting of black warning flags/placards; warbling tone on siren (1 second on-1 second off). ACDE requirements--full ensemble will be worn. GCE requirements--full ensemble will be worn commensurate with ground duties. Personnel will remain indoors or under liquid agent cover.

23.12. Donning Equipment. Aircrew will don ACDE based on the alarm condition. Use the "buddy dressing" procedures, and refer to AMCVA 36-2206, *ACDE Donning Checklist* (projected to be AMCVA 11-303), to ensure proper wear. When wearing the ACDE, Atropine and 2 PAM Chloride auto injectors will be kept in the upper left flight suit pocket. This standardized location will allow personnel to locate the medication should an individual be overcome by nerve agent poisoning. M-9 paper on the flight suit will facilitate detection of liquid chemical agents and ACCA processing. M-9 paper should be placed on the flight suit prior to entering a CBTA when an alarm "yellow" or higher has been declared. When inbound to CBTA, prior to descent, the aircraft commander will ensure crew and passengers don appropriate protective equipment IAW arrival destination's mission oriented protective posture (MOPP) level and brief aircrew operations in the CBTA. As a minimum, this briefing will include: flight deck isolation, oxygen requirements, air conditioning system requirements, CW clothing requirements, ground operations and MOPP levels.

23.13. Ground Operations:

23.13.1. Off/On Considerations. Extreme care must be exercised to prevent contamination of aircraft interiors during ground operations, particularly to the flight deck area. Reduce the number of personnel entering the aircraft. Contaminated engine covers, safety pins and chocks will not be placed in the aircraft unless sealed in clean plastic bags. Onload cargo will be protected prior to and while being transported to the aircraft. Protective covers will be removed just prior to placing the cargo on the aircraft. It is the user's responsibility to determine and decontaminate equipment in his/her charge. Aircrew members entering the aircraft will remove plastic overboots and overcape portions of the aircrew ensemble and ensure flight/mobility bags are free of contaminants and placed in clean plastic bags. Aircrew exiting aircraft into a chemically contaminated environment will don plastic overboots and overcape prior to leaving the aircraft.

23.13.2. Physiological Factors. Aircraft commanders must be very sensitive to the problems resulting from physical exertion while wearing ACDE. The aircraft commander should consider factors such as ground time, temperature and remaining mission requirements when determining on/offload requirements. Individuals involved should be closely monitored for adverse physiological effects.

23.13.3. Communications. Conducting on/offloading operations while wearing the complete ACDE complicates communications capability. Use the mini-amplifier/speaker or the aircraft public address system and augment with flashlight and hand signals as required.

23.13.4. Passenger/Patients. A path should be decontaminated between the aircraft and the ground transportation vehicle to reduce interior decontamination when loading/unloading passengers/patients.

23.14. Chemical Attack During Ground Operations. If an attack (Alarm Red) occurs during on/off-loading operations or transport to and from aircraft, take immediate cover away from the aircraft/vehicle. Follow "buddy dressing" procedures to ensure proper donning of ACDE prior to flight.

NOTE: Aircrews should don the ground crew protective chemical mask and protective helmet, consistent with circumstances and duties. Aircrews could be expected to forward information concerning medical aid, damage estimates, unexploded ordinance. Appropriate information may be forwarded via the aircraft radios to the controlling agencies.

23.15. Crew Rest Procedures. Operational necessity may require the aircrew to rest/fly in a contaminated CBTA. If the mission is not being staged by another aircrew or preflight crews are not available, the aircrew will normally preflight, load, and secure the aircraft prior to entering crew rest. The departing aircrew will perform necessary crew preparations and preflight briefings, then report to the ACCA for processing with assistance from ALS personnel who will assist aircrews donning ACDE prior to reassuming flying duties. If possible, aircrew transport should be provided in a covered vehicle. Aircrews should avoid preflighting aircraft prior to departure to prevent contamination to themselves and the aircraft. As aircrews proceed to fly they will require assistance from ground support personnel in removing their aircrew protective overcape and overboots prior to entering the aircraft.

23.16. Outbound with Actual/Suspected Chemical Contamination. Venting Aircraft/Removing ACDE Components: With actual/suspected vapor contamination, the aircraft must be purged for 2 hours using Smoke and Fume Elimination procedures. To ensure no liquid contamination exists, a close inspection of aircrew, passenger ensembles, and cargo will be conducted using M-8 and M-9 detection paper. M-8 and M-9 detection paper only detects certain liquid agents and will not detect vapor hazards. Above the shoulder ACDE may be removed only if the presence of vapor/liquid agents are not detected or suspected. The aircrew must take every precaution to prevent spreading of liquid contaminants, especially on the flight deck area. The best course is to identify actual/suspected contamination and physically avoid those areas for the remainder of the flight and keep cargo compartments cool. If an aircrew member or passenger has been in contact with liquid contaminants, all personnel aboard the aircraft will stay in full ACDE/GCE until processed through their respective contamination control area (CCA).

23.17. Communicating Down-line Support. Pass chemical contamination information through command and control channels when inbound. This information will be used to determine if a diversion flight is required or decontamination teams are needed. Report the physical condition of any crew/passengers who are showing chemical agent symptoms and whether they are wearing chemical defense ensembles.

23.18. Contamination Control Areas (CCA) Procedures. Aircrews will proceed to the ACCA for processing. Ground personnel will report to the ground crew contamination control area (GCCA) for processing. All personnel will remove protective clothing IAW established procedures located in respective CCA's.

NOTE: Because of the technical characteristics of life support/flying equipment and mission essential aircrew resources, an ACCA is required to ensure minimum exposure to contaminates. GCCA's are generally used to process ground crew personnel and typically are subject to potentially higher concentration levels. The ACCA is equipped and manned by trained ALS personnel to process aircrews and decontaminate their equipment.

23.19. Work Degradation Factors. Work timetables need to be adjusted to minimize thermal stress caused by wearing the ACDE. Aircrews must weigh all factors when performing in-flight and ground duties. The following are degradation factors for wearing full GCE, and may also be used to represent the Task Time Multipliers for the ACDE. To estimate how much time it takes to perform a task or operation, (1) take the Task Time Multiplier for the appropriate Work Rate and ambient air temperature and (2) multiply it by the time it normally takes to perform the task. For example, given a heavy work rate and an air temperature of 70F, the crewmember should expect a normal one-hour task to take 2.1 hours while wearing ACDE. A more extensive discussion of this subject is found in AFMAN 32-4005, *Personnel Protection and Attack Actions.*

Table 23.1. Task Time Multipliers.

TASK TIME MULTIPLIERS			
Work Rate	**Temperature**		
	20-49F	**50-84F**	**85-100F**
Light	1.2	1.4	1.5
Moderate	1.3	1.4	3.0
Heavy	1.7	2.1	5.0

23.20. Forms Prescribed. AF Form 4041, **KC-135 Takeoff Data**; AF Form 4042, **Applied Restraint Computations**; Air Force Form 4100, **KC-135 Load Planning Worksheet**; AF Form 4044, **KC-135 Cargo/Passenger Planning**; AF Form 4045, **Navigation Report**; AF Form 4046, **Celestial Precomputation**; AF Form 4047, **Mission Flight Plan**; AF Form 4048, **Mission Flight Log**; AF Form 4094, **Mission Flight Log - Continuation**; AF Form 4128, **Aircraft Servicing Checklist**; AF Form 4112, **Restraint Computation Worksheet**.

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Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References.

DoD 4515.13R, *Air Transportation Management*

AFPD 10-9, *Lead Operating Command Weapon Systems Management*

AFPD 11-2, *Aircraft Rules and Procedures*

AFPD 10-21, *Air Mobility Lead Command Roles and Responsibilities*

AFI 10-403, *Deployment Planning*

AFI 11-202V1, *Aircrew Training*

AFI 11-202V2, *Aircrew Standardization/Evaluation Program*

AFI 11-202V3, *General Flight Rules*

AFI 11-221, *Air Refueling Management (KC-10 and KC-135)*

AFI 11-222, *Tanker Activity Report*

AFI 11-215, *Flight Manual Procedures*

AFI 11-207, *Flight Delivery of Fighter Aircraft*

AFI 11-209, *Air Force Participation in Aerial Events*

AFI 11-218, *Aircraft Operations and Movement on the Ground*

AFI 11-401, *Flight Management*

AFI 11-2KC-135V1, *KC-135 Aircrew Training*

AFI 11-2AEV1, *Aeromedical Aircrew Training*

AFJI 11-204, *Operational Procedures for Aircraft Carrying Hazardous Materials*

AFI 11-299, *Nuclear Airlift Operations*

AFI 13-207, *Preventing and Resisting Piracy [Hijacking]*

AFI 13-401, *Managing the Information Security Program*

AFI 21-101, *Maintenance Operations and Management Policy*

AFI 23-202, *Buying Petroleum Products and Other Supplies and Services Off-Station*

AFI 31-101, Volume 1, *Air Force Physical Security Program*

AFI 31-401, *Information Security Program Management.*

AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*

AFI 48-104, *Medical and Agricultural Foreign and Domestic Quarantine Regulations for Vessels, Aircraft, and Other Transports of the Armed Forces (Joint)*

AFI 48-123, *Medical Examinations and Standards*

AFI 91-202, *The US Air Force Mishap Prevention Program*

AFI 91-204, *Safety Investigations and Reports*

AFI 37-124, *The Information Collections and Reports Management Program; Controlling Internal, Public, and Interagency Air Force Information Collections*.

AFMAN 10-206, *Operational Reporting*

AFMAN 11-117, *Instrument Procedures*

AFM 67-1V1, *Supply/Fuels Wartime Planning*

AFOSH Standard 127-100, *Aircraft Flight Line - Ground Operations and Activities*

AFPAM 91-212, *Bird Aircraft Strike Hazard (BASH) Management Techniques,*

Abbreviations and Acronyms.

ACDE—Aircrew Chemical Operations and Procedures

ACF—Acceptance Check Flight

AGE—Aircraft Ground Equipment

AOR—Area of Responsibility

APU—Auxiliary Power Unit

AR or A/R—Air Refueling

ARCT—Air Refueling Control Time

ASRR—Airfield Suitability and Restriction Report

ATC—Air Traffic Control

BRNAV—Basic Area Navigation Airspace

C2—Command and Control

CDT—Crew Duty Time

CG—Center of Gravity

CW—Chemical Warfare

CCA—Contamination Control Area

CECR—Crew Enhancement Crew Rest

CFP—Computer Flight Plan

COE—Certification of Equivalency

CSS—Chief Servicing Supervisor

CVR—Cockpit Voice Recorder

DCS—Defense Courier Service

DH—Decision Height

EAL—Entry Access List

EAR—End Air Refueling

EMCON—Emission Option

ETA—Estimated Time of Arrival

ETE—Estimated Time En route

ETIC—Estimated Time in Commission

ETP—Equal Time Point

FCB—Flight Crew Bulletin

FAF—Final Approach Fix

FCF—Functional Check Flight

FCIF—Flight Crew Information File

FDP—Flight Duty Period

FIR—Flight Information Region

FMC—Fully Mission Capable

FMS—Flight Management System

FOD—Foreign Object Damage

FOL—Forward Operating Location

FSO—Flying Safety Officer

GPS—Global Positioning System

HATR—Hazardous Air Traffic Report

ICS—Infant Car Seat

IFF—Identification Friend or Foe

INS—Inertial Navigation System

LAAR—Low Altitude Air Refueling

LRC—Long Range Cruise

MAF—Mobility Air Forces

MARSA—Military Assumes Responsibility for Safe Altitude

MC—Mission Capable

MCD—Medical Crew Director

MDS—Mission Design Series (e.g., KC-135)

ME—Mission Essential

MEL—Minimum Equipment List

MOB—Main Operating Base

MNPS—Minimum Navigation Performance Specifications

MSL—Mean Sea Level

NDB—Non Directional Beacon

NEW—Net Explosives Weight

NM—Nautical Mile

NOTAM—Notice to Airmen

OIS—Obstacle Identification Surface

PDO—Publication Distribution Office

PNF—Pilot Not Flying

PMCR—Post Mission Crew Rest

PPR—Prior Permission Required

PMSV—Pilot to Meteorologist Service

PSN—Proper Shipping Name

RNP—Required Navigation Performance

ROE—Rules of Engagement

RRFL—Required Ramp Fuel Load

RVSM—Reduced Vertical Separation Minimum

SAAM—Special Assignment Airlift Mission

SID—Standard Instrument Departure

SIGMET—Significant Metrorological Information

SPR—Single Point Refueling

STM—Supplemental Training Mission

TKACT—Tanker Activity Report

TOLD—Take off and Landing Data

Terms—The following is a list of common mobility terms and associated abbreviation. Additional terms common to the aviation community may also be found in FAR, Part 1 and DoD FLIP *General Flight Planning*, Chapter 2.

Advanced Computer Flight Plan (ACFP)—An Air Force level system which is the follow on replacement for the Optimized AMC Flight Plan (formerly Jeppesen). The system brings an improved user interface to the customer, runs in Microsoft Windows, and communicates with a mainframe located at Scott AFB IL. Once the optimized flight plans are produced on the mainframe, they are transmitted back to the Window's PC.

Aeromedical Evacuation (AE).—Movement of patients under medical supervision between medical

treatment facilities (MTFs) by air transportation.

Aeromedical Evacuation Coordination Center (AECC)—A coordination center, within the Joint Air Operations Center, which monitors all activities related to aeromedical evacuation (AE) operations execution. It manages the medical aspects of the AE mission and serves as the net control station for AE communications. It coordinates medical requirements with airlift capability, assigns medical missions to the appropriate AE elements, and monitors patient movement activities.

Aeromedical Evacuation Crew member (AECM)—Qualified Flight Nurse (FN) and Aeromedical Evacuation Technician (AET) performing AE crew duties.

Aeromedical Evacuation Operations Officer (AEOO)—Medical Service Corps (MSC) officer or medical administrative specialist or technician (AFSC 4A0X1) assigned to the AE system to perform duties outlined in applicable Air Force policy directives, instructions, 41-series handbooks, and this AFI.

Aeromedical Readiness Mission (ARM)—Training missions using simulated patients to prepare for the wartime/contingency movement of patients.

Air Force Mission Support System (AFMSS)—Provides the Air Force with common interoperable automated flight mission planning hardware and software. Consists of a ground and portable (laptop) system. Interfaces with theater, MAJCOM, and joint data bases from fixed or deployed locations worldwide. Automates previously manually accomplished tasks. Passes Air Tasking order through C2IPS or CTAPS. Threats are provided via the Combat Intel System. AFMSS is multimedia capable with modem provided on ground and portable systems. The portable has a 1553B interface bus for uploading data to the aircraft. AFMSS displays and prints full color charts, NITF imagery, perspective views, mission rehearsals, 3-D fly through, flight planning forms and logs, and Digital Aeronautical Flight Information File information. Uses industry standardized databases and complies with open-system architecture and multilevel security requirements. Built with Commercial Off-The-Shelf (COTS) hardware, and implements nonproprietary software.

Air Force Satellite Communication (AFSATCOM)—Satellite communications system capable of 75 bits per second (BPS) record message traffic.

Air Force Component Commander (AFCC)—In a unified, sub-unified, or joint task force command, the Air Force commander charged with the overall conduct of Air Force air operations.

Airlift—.Aircraft is considered to be performing airlift when manifested passengers or cargo is carried.

Air Mobility Control Center (AMCC)—Provides global coordination of tanker and airlift for AMC and operationally reports to the AMC TACC.Functions as the AMC agency that manages and directs ground support activities and controls aircraft and aircrews operating AMC strategic missions through overseas locations.

Air Mobility Operations Control Center (AMOCC)—Operations center which controls movement of theater assigned air mobility assets.

Air Mobility Element (AME)—Command and control center deployed in theater where detailed planning, coordinating, and tasking for theater tanker and airlift operations are accomplished. The AME receives direction from the director, mobility forces (DIRMOBFOR). The AME is the focal point for communications and the source of control and direction for theater tanker and airlift forces.

Air Refueling Control Point (ARCP)—The planned geographic point over which the receiver(s) arrive in the observation/pre-contact position with respect to the assigned tanker.

Air Refueling Exit Point (A/R EXIT PT)—The designated geographic point at which the refueling track terminates. In a refueling anchor it is a designated point where tanker and receiver may depart the anchor area after refueling is complete.

Air Refueling Initial Point (ARIP)—A point located upstream from the ARCP at which the receiver aircraft initiates a rendezvous with the tanker.

Air Reserve Component (ARC)—Refers to Air National Guard (ANG) and Air Force Reserve Command (AFRC) forces, both Associate and Unit-Equipped.

Air Route Traffic Control Center (ARTCC)—A facility that provides Air Traffic Control (ATC) services to aircraft operating on IFR flight plans within controlled airspace, principally during the en route phase of flight.

Air Traffic Control (ATC)—A service provided by an appropriate authority to promote the safe, orderly and expeditious use of the air transportation system and to maximize airspace utility.

Aircrew Chemical Defense Ensemble (ACDE)—Individually fitted aircrew unique chemical protective equipment for the sole purpose of protecting aircrew while flying into and out of a chemically contaminated environment.

AMC History System (AHS)—Database that compiles and stores tanker activity input by line units.

Augmented Crew—Basic aircrew supplemented by additional qualified aircrew members to permit in-flight rest periods.

Aviation Into-Plane Reimbursement (AIR) Card—A credit card that can be used to purchase aviation fuels, related fuel supplies and ground services at commercial airports where no DoD or Canadian Into-Plane contract exists.

Bird Aircraft Strike Hazard (BASH)—An Air Force program designed to reduce the risk of bird strikes.

Bird Watch Condition (BWC) Low—Normal bird activity [as a guide, fewer than 5 large birds (waterfowl, raptors, gulls, etc.) or fewer than 15 small birds (terns, swallows, etc)] on and above the airfield with a low probability of hazard. However, a single bird in a critical location may elevate the BWC to moderate or severe.

Bird Watch Condition (BWC) Moderate—Increased bird population (approximately 5 to 15 large birds or 15 to 30 small birds) in locations that represent an increased potential for strike. However, could be caused by only a single bird in a critical location.

Bird Watch Condition (BWC) Severe—High bird population (as a guide, more than 15 large birds or 30 small birds) in locations that represent an increased potential for strike. However, could be caused by only a single bird in a critical location.

Block Time—Time determined by the scheduling agency responsible for mission accomplishment for the aircraft to arrive at (block in) or depart from (block out) the parking spot.

BLUE BARK—US military personnel, US citizen civilian employees of the Department of Defense (DoD), and the dependents of both categories who travel in connection with the death of an immediate family member. It also applies to escorts for dependents of military members traveling under competent orders.

Border Clearance—Those clearances and inspections required to comply with federal, state, and local

agricultural, customs, immigration, and immunizations requirements.

Category I Route—Any route that does not meet the requirements of a category II route, including tactical navigation and over water routes.

Category II Route—Any route on which the position of the aircraft can be accurately determined by the overhead crossing of a radio aid (NDB, VOR, TACAN) at least once each hour with positive course guidance between such radio aids.

Chalk Number—Number given to a complete load and to the transporting carrier.

Charge Medical Technician (CMT)—AET responsible for ensuring completion of enlisted aeromedical crew duties.

COIN ASSIST—Nickname used to designate dependent spouses accompanying dependent children and dependent parents of military personnel reported missing or captured who may travel space available on military aircraft for humanitarian purposes on approval of the Chief of Staff, United States Army; Chief of Staff, United States Air Force; Chief of Naval Operations; or the Commandant of the Marine Corps.

Combat Control Team (CCT) —see **Special Tactics Team (STT)**.

Command and Control (C2)—Exercise of direction and authority over assigned forces by a properly designated command echelon in the accomplishment of the mission.

Command and Control (C2) Center—Each C2 center provides supervision, guidance, and control within its assigned area of responsibility. For the purpose of this AFI, C2 centers include operations centers, command posts, air mobility elements, tanker airlift control elements (TALCE), air mobility control centers, and tanker task forces.

Command and Control Information Processing System (C2IPS)—Computer-based information transmission and information handling for command and control functions associated with the Director of Mobility Forces (DIRMOBFOR), AME fixed units, and TALCE. Interfaces to and automatically updates the Global Decision Support System (GDSS).

CONFERENCE SKYHOOK—Communication conference available to help aircrews solve in-flight problems that require additional expertise.

Contingency Mission—Mission operated in direct support of an OPORD, OPLAN, disaster, or emergency.

Critical Phase Of Flight—Takeoff, air refueling, approach, or landing.

Deadhead Time—Duty time for crewmembers positioning or de-positioning for a mission or mission support function.

Department of Defense Activity Address Code (DoDAAC)—A six-position, alpha-numeric code assigned to identify the unit, activity, or organization within DoD that owns the aircraft.

Designated Courier—Officer or enlisted member in the grade of E-5 or above of the US Armed Forces, or a Department of State diplomatic courier, selected by the Defense Courier Service (DCS) to accept, safeguard, and deliver DCS material as directed. A primary aircrew member should be used as a courier only as a last resort.

Desolate Terrain Missions—Any mission in excess of one hour over desert, tropical, or jungle terrain (not to include flights conducted over the CONUS.

Deviation—A deviation occurs when takeoff time is not within -20/+14 minutes of scheduled takeoff time.

Direct Instructor Supervision—Supervision by an instructor of like specialty with immediate access to controls (for pilots, the instructor must occupy either the pilot or copilot seat).

Director, Mobility Forces (DIRMOBFOR)—Individual responsible for theater mobility force management. The Air Force component commander exercises operational control of assigned or attached mobility forces through the DIRMOBFOR. The DIRMOBFOR monitors and manages assigned mobility forces operating in theater. The DIRMOBFOR provides direction to the Air Mobility Division in the AOR to execute the air mobility mission and will normally be a senior officer familiar with the AOR.

Distinguished Visitor (DV)—Passengers, including those of friendly nations, of star or flag rank or equivalent status, to include diplomats, cabinet members, members of Congress, and other individuals designated by the DoD due to their mission or position (includes BLUE BARK and COIN ASSIST).

Double Blocking—When an aircraft is required to block-in at one parking spot, then move to normal parking for final block-in. The extra time required for double blocking will be taken into account during mission planning/scheduling. To compensate for double blocking on departure, the aircrew "legal for alert time" may be adjusted to provide additional time from aircrew "show time" to departure. When double blocking is required on arrival, the aircrews entry into crew rest will be delayed until postflight duties are complete.

Dual Role—Any mission where both air refueling and airlift are provided to the user. Primary mission role is normally air refueling. Missions where cargo movement is primary require a dedicated funded special assignment airlift mission (SAAM).

Due Regard—Operational situations that do not lend themselves to International Civil Aviation Organization (ICAO) flight procedures, such as military contingencies, classified missions, politically sensitive missions, or training activities. Flight under "Due Regard" obligates the military AC to be his or her own air traffic control (ATC) agency and to separate his or her aircraft from all other air traffic. See FLIP General Planning, sec. 7.

Equal Time Point (ETP)—Point along a route at which an aircraft may either proceed to destination or first suitable airport or return to departure base or last suitable airport in the same amount of time based on all engines operating.

Estimated Time In Commission (ETIC)—Estimated time required to complete required maintenance.

Execution—Command-level approval for initiation of a mission or portion thereof after due consideration of all pertinent factors. Execution authority is restricted to designated command authority.

Experienced Copilot (ECP)—Copilot with 500 total flying hours (not including "other" time) of which a minimum of 200 hours are in the primary assigned aircraft (PAA). Individual must also be designated an "experienced copilot" by the squadron commander. Designation indicates the squadron commander certifies the individual is progressing normally toward upgrade to AC.

Familiar Field—An airport in the local flying area at which unit assigned aircraft routinely performs transition training. Each operations group commander will designate familiar fields within their local flying area.

Forced Rendezvous Point (FRP)—Navigational checkpoint over which formations of aircraft join and become part of the main force.

Fuel Reserve—Amount of usable fuel that must be carried beyond that required to complete the flight as planned.

Global Decision Support System (GDSS)—AMC's primary execution command and control system. GDSS is used to manage the execution of AMC airlift and tanker missions.

Global Patient Movement Requirements Center—A joint activity reporting directly to the Commander in Chief, US Transportation Command, the Department of Defense single manager for the regulation of movement of uniformed services patients. The Global Patient Movement Requirements center authorizes transfers to medical treatment facilities of the Military Departments or the Department of Veterans Affairs and coordinates intertheater and inside continental United States patient movement requirements with the appropriate transportation component commands of US Transportation Command.

Ground Time—Interval between engine shut down (or arrival in the blocks if engine shutdown is not scheduled) and next takeoff time.

Hazardous Cargo or Materials (HAZMAT)—Articles or substances that are capable of posing significant risk to health, safety, or property when transported by air and classified as explosive (class 1), compressed gas (class 2), flammable liquid (class 3), flammable solid (class 4), oxidizer and organic peroxide (class 5), poison and infectious substances (class 6), radioactive material (class 7), corrosive material (class 8), or miscellaneous dangerous goods (class 9). Classes may be subdivided into divisions to further identify hazard, i.e., 1.1, 2.3, 6.1, etc.

Instructor Supervision—Supervision by an instructor of like specialty. For critical phases of flight, the instructor must occupy one of the seats or stations, with immediate access to the controls.

Interfly—The exchange and/or substitution of aircrews and aircraft between Mobility Air Forces (MAF) including crewmembers and/or aircraft from AMC, AETC, ACC, PACAF, USAFE, and AMC-gained ANG and AFRC forces.

In-Place Time (IPT)—Time when an aircraft and crew are at an operating base and prepared to load for the mission.

Joint Airborne/Air Transportability Training (JA/ATT)—Continuation and proficiency combat airlift training conducted in support of DoD agencies. Includes aircraft load training and service school support. AMC headquarters publishes JA/ATT tasking in AMC OPORD 17-76, annex C, appendix 1.

Loading Time—Specific time established jointly by the commanders concerned when aircraft loading will begin.

Local Training Mission—A mission scheduled to originate and terminate at home station (or an off-station training mission), generated for training or evaluation, and executed at the local level.

Maintenance Status:—

A-1—No maintenance required.

A-2 (Plus Noun)—Minor maintenance required, but not serious enough to cause delay. Add nouns that identify the affected units or systems, i.e. hydraulic, ultra high frequency (UHF) radio, radar, engine, fuel control, generator, boom or drogue, etc. Attempt to describe the nature of the system malfunction to the extent that appropriate maintenance personnel will be available to meet the aircraft. When possible, identify system as mission essential (ME) or mission contributing (MC).

A-3 (Plus Noun)—Major maintenance. Delay is anticipated. Affected units or systems are to be

identified as in A-2 status above.

A-4—Aircraft or system has suspected or known biological, chemical, or radiological contamination.

Medical Crew Director (MCD)—FN responsible for supervising patient care and AEMCs assigned to AE missions. On missions where a FN is not onboard, the senior AET will function as MCD.

Mission—Movement of aircraft from a designated point of origin to a designated destination as defined by assigned mission identifier, mission nickname, or both in the schedule, mission directive, OPORD, OPLAN, or Frag order.

Mission Advisory—Message dispatched by command and control agencies, liaison officers, or ACs advising all interested agencies of any changes in status affecting the mission.

Mission Clinical Coordinator (MCC)—A qualified MCD or CMT, in addition to the basic crew and instructors and flight examiners. Responsible for coordinating training activities on ARMs.

Mobility Air Force (MAF)—Forces assigned to mobility aircraft or MAJCOMs with operational or tactical control of mobility aircraft.

Multipoint Refueling System (MRPS)—Refers to aircraft modified with TCTO 628, which allows offload of fuel in-flight from either of two wing tip mounted air refueling (A/R) pods.

Off Station Training Flight—A training flight that originates or terminates at other than home station that is specifically generated to provide the aircrew experience in operating away from home station. Off station trainers will not be generated solely to transport passengers or cargo.

Operational Control (OPCON)—Functions of command and control involving composition of subordinate forces, authority to approve allocation of assets to specific missions, assignment of tasks, designation of objectives, and authoritative direction necessary to accomplish the mission. This is a higher authority than the command that performs specific mission functions.

Operational Risk Management (ORM)—ORM is a logic-based, common sense approach to making calculated decisions on human, materiel, and environmental factors before, during, and after Air Force operations. It enables commanders, functional managers and supervisors to maximize operational capabilities while minimizing risks by applying a simple, systematic process appropriate for all personnel and Air Force functions.

Operational Missions—Missions executed at or above TACC level. Operational missions termed "CLOSE WATCH" include CORONET missions and AFI 11-221, *Air Refueling Management (KC-10 and KC-135)*, priority 1, 2, and 3 missions tasked by the TACC. Other operational missions such as deployment, re-deployment, reconnaissance operations, operational readiness inspections (ORI), AMC channel or SAAM, and JA/ATT missions may be designated "CLOSE WATCH" as necessary.

Opportune Airlift—Transportation of personnel, cargo, or both aboard aircraft with no expenditure of additional flying hours to support the airlift.

Originating Station—Base from which an aircraft starts on an assigned mission. May or may not be the home station of the aircraft.

Over water Flight—Any flight that exceeds power off gliding distance from land.

Pacer CRAG (PC)—Refers to aircraft modified with TCTO 1433, which replaced the compass and radar systems and incorporated an onboard GPS.

Patient Movement Categories—

Urgent—Patients who must be moved immediately to save life, limb, or eyesight, or to prevent complication of a serious illness.

Priority—Patients requiring prompt medical care that must be moved within 24 hours.

Routine—Patients who should be picked up within 72 hours and moved on routine/scheduled flights.

Permit to Proceed—Aircraft not cleared at the first US port of entry may move to another US airport on a permit to proceed issued by customs officials at the first port of entry. This permit lists the requirements to be met at the next point of landing, i.e. number of crew and passengers, cargo not yet cleared. ACs are responsible to deliver the permit to proceed to the customs inspector at the base where final clearance is performed. (Heavy monetary fines can be imposed on the AC for not complying with permit to proceed procedures.)

Point Of No Return—Most distant point along the planned route from which an aircraft may safely return to its point of departure or alternate airport with approach and landing fuel.

Point of Safe Return—Most distant point along the planned route from which an aircraft may safely return to its point of departure or alternate airport with required fuel reserve.

Positioning and De-positioning Missions—Positioning missions are performed to relocate aircraft for the purpose of conducting a mission. De-positioning missions are made to return aircraft from bases at which missions have terminated.

Quick Stop—Set of procedures designed to expedite the movement of selected missions by reducing ground times at en route or turnaround stations.

Ramp Coordinator—Designated representative of the C2 center whose primary duty is the coordination of ground handling activities on the ramp during large-scale operations.

Scheduled Return Date (SRD)—Scheduling tool used by air mobility units to predict when crews will return to home station. It allows force managers to plan aircrew availability and provide crews visibility over monthly flying activities. AMC and AMC-gained aircrews (except those on standby at home station) will have an SRD established on their flight orders.

Scheduled Takeoff Time—Takeoff time is established in the schedule or OPORD. For air aborts and diversions, this will be engine shut down time (or arrival in the blocks if engine shutdown is not scheduled) plus authorized ground time. Early deviation does not apply to aborts or diversions unless the mission is formally rescheduled by current operations. Scheduled takeoff time may be adjusted to make good an ARCT. Notify controlling agency prior to takeoff to adjust the scheduled takeoff time.

Section—Subdivision of a formation. A section normally consists of 6 aircraft (2 elements).

Serial—Normally consists of 12 aircraft (2 sections or 4 elements).

Significant Meteorological Information (SIGMET)—Area weather advisory issued by an ICAO meteorological office relayed to and broadcast by the applicable ATC agency. SIGMET advisories are issued for tornadoes, lines of thunderstorms, embedded thunderstorms, large hail, severe and extreme turbulence, severe icing, and widespread dust or sand storms. SIGMETs frequently cover a large geographical area and vertical thickness. They are prepared for general aviation and may not consider aircraft type or capability.

Special Assignment Airlift Mission (SAAM)—Funded airlift that cannot be supported by channel

missions because of the unusual nature, sensitivity, or urgency of the cargo or that requires operations to points other than the established channel structure.

Special Tactics Team (STT)—Team of Air Force personnel organized, trained, and equipped to establish and operate navigational or terminal guidance aids, communications, and aircraft control facilities in support of combat aerial delivery operations.

Stations Time (Air Force)—Normally, 30 minutes prior to takeoff time for the KC-10, KC-135, C-130, C-141, and OSA aircraft (45 minutes for C-5 and C-17). Aircrews will have completed their pre-flight duties and be at their crew positions. Passengers will be seated and cargo will be secured.

Tanker Airlift Control Center (TACC)—Operations center that controls tanker and airlift forces worldwide through a network of computer systems. The TACC is organized into geographic cells consisting of East, West, and Emergency Action Cells. The TACC contains the following functions: Mobility Management, Global Channel Operations, Operations Management, Current Operations, Global Readiness, Weather, Logistics Readiness Center, Aerial Port Control Center, International Clearances, and Flight Plans.

Tactical Event—Formation and threat avoidance approaches/departures (TAA/D).

Tanker Airlift Control Element (TALCE)—Team of qualified Air Force personnel established to control, coordinate, and function as an Air Force tanker and airlift C2 facility at a base where normal AMC C2 facilities are not established or require augmentation. TALCEs support and control contingency operations on both a planned and no-notice basis.

Tanker Task Force (TTF)—Force of tanker aircraft assembled and tasked to perform a specific function.

Theater Patient Movement Requirements Center (TPMRC)—The TPMRC is responsible for theater wide patient movement (e.g., medical regulating and AE scheduling), and coordinates with theater MTFs to allocate the proper treatment of assets required to support its role. The primary role of the TPMRC is to devise theater plans and schedules and then monitor their execution in concert with the GPMRC. The TPMRC is responsible to the Combatant Commander through the Combatant Command Surgeon. The TPMRC is also responsible for all aspect of intratheater patient movement management. A TPMRC provides command and control for patient movement management operations in its theater of operations, as directed by its Combatant Commander's operational policy, and in coordination with USTRANSCOM, acting as a supporting combatant command, responsible for intertheater and CONUS patient movement.

Time Out—Common assertive statement used to voice crewmember concern when safety may be jeopardized.

Training Mission—Mission executed at the unit level for the sole purpose of aircrew training for upgrade or proficiency. Does not include operational missions as defined in this AFI.

Transportation Working Capital Fund (TWCF)—Formerly known as Defense Business Operations Fund-Transportation (DBOF-T). Part of the Air Force Working Capital Fund (AFWCF). Normally used to cover costs that can be recovered from an air mobility customer. Examples include TDY costs, site surveys of TALCE or airlift unit deployment bed down locations, airlift unit level mission planning expenses, and support or contract costs for deployed TWCF units/personnel.

Unilateral—Operations confined to a single service.

Unit Move—A mission airlifting military passengers or troops who originate from the same unit and onload point, are under the control of a designated troop commander, and offload at the same destination.

Zero Fuel Weight—Weight, expressed in pounds, of a loaded aircraft not including wing and body tank fuel. All weight in excess of the maximum zero fuel weight will consist of usable fuel.

Attachment 2

KY-58 SECURE VOICE CHECKLIST

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KY-58 KEYING CHECKLIST

1. UHF/COMM Radio - ON, MAIN: Use either COMM 1 or COMM 2

2. Ciphony Control Panel:
   a. Power Switch - ON
   b. Zeroize Switch - DOWN
   c. Delay Switch - DOWN
   d. Mode Switch - C/RAD1 (COMM 1) or C/RAD2 (COMM 2)

3. KY-58 Processor Control:
   a. Volume Knob - set halfway
   b. Fill Switch - 1 thru 6 (ensure not in Z1-5 or Z-ALL)
   c. Mode Switch - C
   d. Z-AHQ Adapter - BBN, unless otherwise coordinated
   e. Filter Switch - IN (if DP); OUT (if BB)
   f. Power Switch - ON; crypto alarm (continuous beeping) should be heard. If no beeping is heard, ensure fill select switch 1-5 or Z-ALL. If there is still no beeping, attempt zeroizing the KY-58 and re-start this checklist again.

*Clear beeping by keying the mike switch (with COMM radio selected on the interphone panel) or pushing the PTT switch.

4. KYK-13 Keying Device:
   a. Power Switch - OFF
   b. Fill Switch - 1-6, corresponding to fill select switch on KY-58
   c. Connect KYK-13 to KY-58

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KY-58 KEYING CHECKLIST (CONT)

5. KY-58 Mode Switch—LD; constant tone should be heard indicating an empty register. A beep indicates a variable is stored in the register.

   * Clear the tone by pushing the spring loaded REM/LOC switch down and releasing, then pushing the PTT switch.

6. Turn KYK-13 Power Switch ON, should hear one beep and red light should flash.

7. Transfer code by slowly keying the mike switch. Should hear a beep when the mike is keyed and another when it is released. Should also see red light flash on the KYK-13.

8. Transfer other codes by changing fill switches on both the KYK-13 and KY-58 and slowly keying the mike.

9. Turn KYK-13 OFF and disconnect from the KY-58.

10. Turn KY-58 Mode Switch to "C."

11. Turn Ciphony Control Mode Switch back to PLAIN, and COMM radio back to BOTH.

12. To Transmit in secure:
    a. Select C/RAD1 or C/RAD2.
    b. Select COMM radio on wafer switch.
    c. Key mike, wait for single beep, begin talking.

NOTE: When in secure mode, you can receive both secure and unsecure transmissions. Secure transmissions begin with a beep.

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KY-58 ZEROIZING PROCEDURES

NOTE: If the Ciphony is not zeroized, the airplane is classified and must be guarded.

NOTE: Aircraft power and a COMM radio must be on for zeroizing.

1. Ciphony Control Panel:
   a. C/RAD1 or C/RAD2
   b. Zeroize Switch - Zeroize and leave guard raised.

2. KY-58 Processor Control:
   a. Fill Switch - Pull and rotate CW to Z-ALL.
   b. Key mike, switch thru fill positions and listen for a constant tone in all positions.
   c. Power Switch - OFF.

3. Ciphony Control Panel:
   a. Mode Select Switch - PLAIN.
   b. Power Switch - OFF.

KYK-13 ZEROIZING PROCEDURES

1. Power Switch - ON.
2. Fill Switch - Z-ALL.
3. Mode Select Switch - Z (must hold in Z position).
4. Initiate Button - PRESS.
5. Mode Select Switch - OFF/CHECK; rotate thru fill positions, if red light flashes repeat steps 1-4.

NOTE: Plain text transmissions can still be received in the Cipher mode.

NOTE: Ciphony and HAVE QUICK can operate simultaneously.

MARVIN R. ESMOND, Lt General, USAF
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